

Corporate Interests or Environmental Sustainability:
What effect has GMO policy had on the core environmental policies enacted in the
United States in the 1970s?

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Abstract

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This analysis works to provide a linkage between corporate interests, GMO policy and the corresponding effects on environmental policies in the United States. By running two separate tests, one focusing on State legislatures and the other on the Supreme Court, this analysis provides evidence of corporations using GMO policy as a vehicle to alter environmental policies in the U.S. At the Supreme Court level, this analysis examines the two most recent cases involving Monsanto, the de facto face of the genetically modified movement, *Bowman v. Monsanto* (2013) and *Monsanto v. Geertson Seed Farms* (2010). By focusing on the core goals of environmental policies, this analysis determines whether the goals of environmental policy or the goals of corporations are more successful in the Supreme Court. Next this paper examines the GMO labeling efforts made in State legislatures and the corresponding anti-GMO initiatives that corporations, specifically Monsanto, use to fight the labeling initiatives. After examining the data from both tests, there is a correlation between Monsanto's influence on GMO policy in the United States, and the correlating influence on environmental outcomes.

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Introduction

“Multiply, vary, let the strongest live and the weakest die.”

Charles Darwin, *The Origin of Species*

Charles Darwin’s principle of natural selection through survival of the fittest is exemplified throughout human history. Nowhere more so is this principle illustrated than in anthropogenic agricultural practices. For centuries, farmers have been saving plant seeds that contain certain desired genetic traits; which could include anything from the best taste, the most colorful, the highest or largest growing, to containing a pest or drought resistant gene. However, in today’s world of constant scientific and technological innovation, pressure is being put onto farmers to abandon this practice of seed saving, in favor of genetically engineered seeds from corporations like Monsanto and DuPont. These GMOs, or genetically modified organisms, have been created with the desired effect to increase crop yield, and have been advertised to reduce the overall effect of agricultural practices on the environment, through herbicide or pest resistance traits.

When the idea of genetically engineering organisms became a reality in the 1970s and 1980s the U.S. was faced with its first test of how to regulate new science and technological practices (Hoffman). The question arose, should the U.S government regulate GMOs using preexisting laws, or create new laws and regulations that deal specifically with the new innovations? The Reagan administration decided on the former, to regulate GMOs under preexisting laws (ibid). These laws, and their implementation in today’s world, are the focus of this document. I ask the question, how have the laws that are being used to regulate GMOs affected core environmental policies enacted in the 1970s: the Clean Air Act, Clean Water Act, and the Endangered Species Act?

This paper examines how GMO policy has affected, if at all, the core environmental policies listed above. The analysis starts with a detailed review of the creation and current implementation of GMO policy in the U.S. as well as the main goals of the core environmental policies that were enacted in the 1970s. From this background, the study proceeds to identify a relationship between GMO policy and the 1970 environmental policies. Though GMO and environmental policies have very different roots, this study focuses on how the implementation of U.S. GMO policy has led to shifting environmental policy goals. In particular, drawing from historic and legal records, the following hypothesis is tested: the continued legal advancement, adoption and implementation of GMO policies has resulted in a policy shift, from protecting environmental and public health interests towards protecting corporate interests. What are the implications of this? Conclusions and recommendations for further research focus on what this means for our environmental future.

The study starts with a broad-based review of both GMO and the core environmental policies that were enacted in the 1970s. This review provides the foundation for testing the GMO policy-led shift in the focus of the environmental policies more generally. Court rulings, where GMO policies have evolved over time, and State legislative initiatives where GMO issues are being played out, are examined to make the argument that GMO and environmental policy has shifted focus from environmental issues, to corporate interests.

Background and Literature Review

To test whether there has been a shift in environmental policies to favor corporate interests, background information is necessary. This study provides a background of the historic evolution of policies supporting the development of genetically modified organisms. The study goes on to provide the basic principles that embody the major laws to regulate the environment, the Clean Air Act, Clean Water Act and the Endangered Species Act. Background information on the face of corporate agribusiness, Monsanto, will be used to illustrate a relationship between the policy shift favoring corporate interests, which for the sake of this study, is embodied by Monsanto. To close out the background section, a theoretical background in what principles are being applied to genetically modified organism policy, in this case, the risk assessment principle, is provided.

The Historic Evolution of Policies Supporting the Development of Genetically Modified Organisms

In order to answer the question of whether GMO policy has altered the core environmental policies that were enacted in the 1970s, a basic understanding of what the current GMO policy is and how it came about is needed.

In 1986, the White House Office of Science and Technology Policy issued a Coordinated Framework for Regulation of Biotechnology. This was the first example of specific policy to regulate agricultural biotechnology. The Coordinated Framework for Regulation of Biotechnology divided the regulatory authority among three federal agencies, the United States Department of Agriculture (USDA), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). Each of these

three federal agencies was given jurisdictional boundaries over certain parts of the agricultural biotechnology business. The USDA would regulate the testing and commercialization of new agricultural biotechnology products. The FDA would regulate the introduction and marketing of foods created through the use of genetic engineering. The EPA would regulate the genetically altered microorganisms and pesticide properties of genetically engineered plant varieties (Peck).

When agricultural biotechnology started becoming commercially available, the Reagan administration was forced to make a decision, to make new laws to deal specifically with agricultural biotechnology, or use preexisting laws and statutes to regulate this new innovation. The Reagan administration and the White House Office of Science and Technology Policy (OSTP) decided to use existing laws to regulate agricultural biotechnology (ibid). When the OSTP divided the regulatory authority for agricultural biotechnology among the three agencies, they gave each agency authority to regulate from, in some cases, decades old legislation. The USDA drew its authority from the Federal Plant Pest Act of 1957, which was later reorganized in the Plant Protection Act of 2000 giving the USDA jurisdiction over bacteria and viruses. The FDA bases its regulatory authority primarily through the Federal Food, Drug, and Cosmetic Act of 1938. This includes authorization for the FDA to ensure food safety through regulation of food additives and misbranding. The EPA was given regulatory authority from the pesticide and toxics control laws of the 1970s, including the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA) (ibid).

The 1986 Coordinated Framework was then buttressed by the 1992 “Final Statement on Scope” published by the OSTP. This Final Statement on Scope officially introduced the doctrine of Risk Assessment into GMO policy. The statement put into place principles that would guide agency discretion. This statement articulates the Risk Assessment principle that was being implemented, “federal agencies shall exercise oversight of planned introductions of biotechnology products into the environment only upon evidence that the risk posed by the introduction is unreasonable, that is, where the values of the risk-reduction measure outweighs the cost of the measure” (ibid).

It is important to note that GMO policy in the United States was administratively enacted, meaning that it did not go through Congress. The Reagan Administration relied on pre-existing laws that could now apply to genetically modified organisms. The courts have then backed up this administrative action over time through various court rulings, two of which will be examined later.

Patent protection and the ability to protect individual intellectual property is a staple of the United States. For example, at its founding, the U.S. Constitution recognized the power of Congress “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries” (Article I, Sec. 8, clause 8, U.S. Constitution). The Congress subsequently enacted a series of statutes that formalized the processes for securing patents, including the Patent Acts of 1790 and 1793, and the 1836 Patent Act that established the first U.S. Patent Office. Notably, the subject matter covered under patents was first defined in 1793 “any new and useful art, machine, manufacture or composite of matter and any new and useful improvement on any art, machine, manufacture of

composition of matter” (Patent Act of 1793, Chap. 11, 1 Stat. 318-323, February 21, 1793). This definition is still in use today, as yet another example of pre-existing legislation and definitions being applied to modern day technology, or in this case, biotechnology. What would be covered under this broad definition? Are seeds the subject of the sort of “new and useful improvement” that the Patent Act first sought in 1793? Clearly, establishing this link was critical to the GMO industry.

When Monsanto and other agribusinesses were able to win the right to patent genetically modified organisms, specifically seeds, it gave those companies the license to effect environmental policies through the guise of patent protection. The right to patent a plant was first given in The Plant Patent Act of 1930, and then amended in 1952 to include “cultivated sports, mutants, hybrids and newly found seedlings were patentable” (Food Inc. Movie and Seed Patents) It wasn’t until 1985 that the US Patent and Trademark Office (USPTO) ruled that genetically modified plants, seeds, and plant tissue cultures could be patented (Ex Parte Hibbard). This ruling effectively extended *Diamond v. Chakrabarty* (1980), which dealt specifically with the genetic modification of microorganisms (ibid). The U.S. Supreme Court then affirmed that plants are protectable by patents in *J.E.M Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc.* in 2001 (Food Inc. Movie and Seed Patents). The issue of GMO patents, is one of the major talking points of this paper.

Major Laws to Regulate the Environment

While the Clean Air Act, the Clean Water Act, and the Endangered Species Act are not the only laws adopted in the 1970s, these embody some of the most popular and

far-reaching legal changes of environmental movement. By examining these three laws, a more comprehensive conclusion can be made, to see if corporate interests are now affecting the core environmental policies in the United States. To accurately find out, the biggest environmental policies must be examined, and in this case, they are the Clean Air Act, the Clean Water Act and the Endangered Species Act.

Clean Air Act

The Clean Air Act, enacted in 1970 and amended in 1977 and 1990, marks a significant environmental law that was enacted during a time that saw the implementation of our nations' strongest environmental laws. The act was created in order to reduce pollutant emissions with the primary focus on reducing the threat to human health from exposure to poor air quality. The new law was designed to develop and implement federal ambient air quality standards, create new source performance standards, regulate hazardous air pollution, put into place tailpipe standards for mobile sources, and include statutory deadlines, with publicly available monitoring reports (Nordhaus). The Clean Air Act gives the Environmental Protection Agency the most comprehensive regulatory authority over the control of air pollution emissions. Under this regulatory authority, the EPA sets a national ambient air quality standard (NAAQS), that specify the maximum permissible level of an air pollutant in the ambient air, which are set at a level that is requisite to protect public health and public welfare "allowing an adequate margin of safety" (Nordhaus, 369).

After the EPA sets the NAAQS, each state is required under the Clean Air Act to adopt and submit to the EPA a plan showing how it will attain and maintain the required air quality standards within the state (State Implementation Plan or SIP) (ibid). The EPA has the authority under the Clean Air Act to either approve the SIP if the plan

demonstrates that it is in compliance with the NAAQS, through emissions inventories and modeling, or deny the plan and require the state to revise the plan. However, the main flaw in the Clean Air Act is the grandfathering policy in the 1970 statute, and subsequent amendments. This was instituted because it was believed that “advanced pollution control equipment could be most economically installed when the facility is constructed or it is otherwise undergoing major changes” (Nordhaus, 373). Facilities that can prove that no modifications have occurred are not included under the CAA. “The outcome of the Act’s grandfathering policies can be seen most clearly in the electric power sector. Almost a third of the U.S. coal fleet continues to operate without modern pollution controls” (Nordhaus, 375).

The Clean Air Act was enacted with the primary goal of protecting human health against air pollution. Contemporary critics have attempted to undermine the authority of the EPA to regulate air quality due to the costs of regulation both in terms of government spending and the burdens placed on manufacturers and other sources of air pollution. However, as shown in Figure 1, below, nearly half of Americans remain concerned about air pollution in spite of existing regulatory policy. Moreover, as the American Lung Association found in a 2012 bipartisan poll, “about two-thirds of voters (66 percent) favor EPA updating air pollution standards by setting stricter limits” (Public Wants EPA).

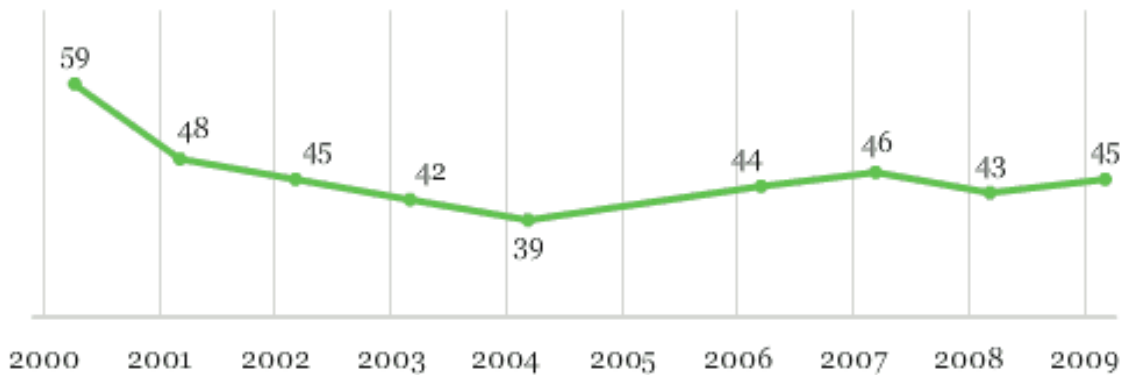
Air quality concerns have been cited with respect to GMOs as well. For example, some point to the likelihood of increased usage of pesticides with Roundup Ready seeds, one of Monsanto’s most widely used products. As Monsanto explains, Roundup Ready soybean seeds were first commercialized in 1996, followed by alfalfa, corn, cotton,

spring canola, sugar beets and winter canola. Use of these seeds “means you can spray Roundup agricultural herbicides in-crop from emergence through flowering for unsurpassed weed control (Who We Are). With widespread spraying of agricultural herbicides, the likelihood of chemical drift to neighboring farms and cities increases, and a growing air quality concern.

Figure 1: Public Opinion and Air Pollution

*U.S. Public Concern About Air Pollution**

Percentage worried "a great deal"



* Trend since 2000; earlier results available in tables at end of this report

GALLUP POLL

Clean Water Act

The Clean Water Act of 1972 was designed to “control the discharge of pollutants to U.S waters from point sources through the National Pollutant Discharge Elimination System (NPDES) based on effluent limits for industrial wastewater and municipal sewage discharges” (Grumbles, 186). Like the Clean Air Act, the Clean Water Act has its primary focus on the control of pollutants known to be harmful to human health. Overall, the Clean Water Act has been successful in cleaning up the United States’ water. No longer do you have waterways catching on fire, as you did with the Cuyahoga River

in Cleveland, Ohio, or Great Lakes being pronounced dead or dying, as was the case before the Clean Water Act was enacted (Lovett). However, problems still exist with the Clean Water Act.

Last year, at the U.S. Conference of Mayors, the members called upon Congress and the Obama administration to amend the Clean Water Act, “citing its undue financial burden on local governments” (Landers). When the Clean Water Act was implemented, local governments relied upon federal funding and grants to achieve the goals set forth by the act. Among these were the building and ongoing operation of municipal wastewater treatment facilities designed to ensure that dirty water would be cleaned. However, as the mandates set forth by the act become more and more expensive, funding from the federal government is decreasing. “In 2009 local governments spent \$103 billion on activities related to clean water, up from \$50 billion in 1995” (ibid). At the Conference of Mayors, mentioned above, the mayor’s crosshairs were aimed at the EPA’s use of enforcement actions to address sewer overflows. Jim Suttle, the mayor of Omaha, Nebraska, argues that “the consent decrees are a huge barrier to finding new technologies and green solutions” and that the EPA’s reliance on these consent decrees has impeded innovative solutions to the problems of achieving clean water (ibid).

The United States public, according to data from Gallup, remains very concerned about water quality issues. As shown in Figure 2, water pollution has been an ongoing public issue, with at least half of Americans stating they were “worried a great deal” in most of the polling period, 2000-2009.

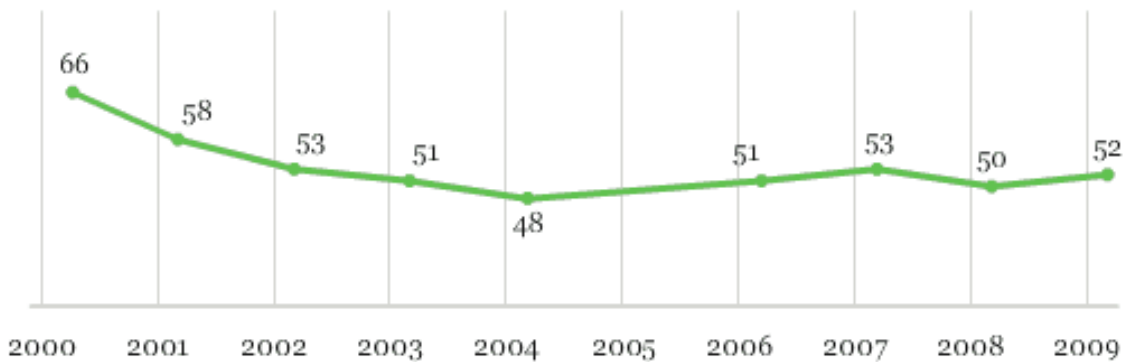
Worries about water quality are being heightened with news of contaminated water runoff from farms, bringing pesticides and other chemicals into local water

channels. The public radar is on high alert. Increased knowledge of widening applications of genetically modified organisms in agricultural settings should only exacerbate some of those concerns.

Figure 2: Public Opinion and Water Pollution

*U.S. Public Concern About Pollution of Rivers, Lakes, and Reservoirs**

Percentage worried "a great deal"



* Trend since 2000; earlier results available in tables at end of this report

GALLUP POLL

Endangered Species Act

The Endangered Species Act (ESA) was one, among many environmental polices passed in the 1970s that shaped present day environmental policy in the United States.

The ESA was created “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved (and) to provide a program for the conservation of such...species (section 2(b))” (Waples, 726). Thus, unlike the direct human health focus of both the Clean Air Act and the Clean Water Act, the Endangered Species Act made as its primary goal the protection of other species. This piece of legislation passed by Congress outlined specific goals for the ESA: to identify

species at heightened risk, to protect those species from further harm, and to establish recovery programs (ibid).

The ESA has been the most heavily scrutinized environmental act since its creation in 1973. This is likely due to broad public disagreement over priorities: how much focus should be placed on protecting other species rather than human interests, and most particularly when human interests might be restricted in the process? Dissenters of ESA argue that “the ESA does not allow for reasonable comparisons of costs and benefits” and the economic effects “can range from mild irritations to loss of almost all economic value of the land in question” (Simmons). The act has stopped economic development in many areas of the country, causing overall support of the act, which was once very high, to diminish since its inception. However, the act has been relatively successful in preventing species from going extinct. “A 2012 study published by the Center for Biological Diversity, a nonprofit group dedicated to the protection of endangered species and wild places, compared the actual and projected extinction rate of ESA-listed species, concluding that the act prevented the extinction of 227 species” (Groc). The economic versus species argument has been implemented so much that the ESA was amended from prohibiting development to allowing permits for economic activities.

Specifically in 1982 Congress amended the ESA to introduce incidental take permits in connection with conservation plans that met requirements to recover a species, or “habitat conservation plans” (ibid) This amendment allowed for developers “to take an endangered species, degrading its habitat or even killing it in exchange for conservation measures such as setting land aside elsewhere for the impacted species” (ibid). This was

seen as a viable compromise between developers and conservationists, because there was such a high potential for conflict between developers and endangered species. This approach started in the 1990s, and became extremely popular among local jurisdictions, especially in California. These local governments “opted for multi-species habitat conservation plans in order to protect a large set of species while facilitating economic development under a single agreement” (ibid). While initially the goal of the Endangered Species Act was to preserve biological resources (Simmons), it has added a caveat to preserve biological resources while not severely hindering economic growth.

Out of the three laws under research, the core value of protecting plant and animal species seems to hold the lowest levels of support by the American people. As Figure 3 below illustrates, less than 40 percent of the sample polled by Gallup expressed “a great deal” of worry about the extinction of plant and animal species. This is compared to the 52 percent in the same 2009 poll who were worried about air pollution, and the 59 percent worried a great deal about drinking water. This brings up a basic point from this review of three core environmental laws: the Clean Air Act and Clean Water Act focus specifically on human health, while the Endangered Species Act focuses on ecological health. Public regard for these two contrasting sets of issues appears distinct.

Figure 3: Comparing Levels of Public Concern for Several Environmental Issues

Percentage Worried "a Great Deal" About Each Environmental Issue

Selected years*

	April 2000	March 2004	March 2009
	%	%	%
Pollution of rivers, lakes, and reservoirs	66	48	52
Air pollution	59	39	45
The loss of tropical rain forests	51	35	42
The "greenhouse effect" or global warming	40	26	34
Contamination of soil and water by toxic waste	64	48	52
Pollution of drinking water	72	53	59
Extinction of plant and animal species	45	36	37
Supply of fresh water for household needs	42	47	49

*See tables at end of report for full trends

GALLUP POLL

Neoliberalism and the Rise of Monsanto

Monsanto has become the face of agricultural biotechnology. They have been incredibly successful in the United States and around the globe. In 2011, Monsanto was the largest biotechnology seed company in the world, reporting 2011 net sales of \$11.8 billion and profits of \$1.6 billion (Monsanto: A Corporate Profile). Monsanto advertises itself as being a “sustainable agriculture company... focused on empowering farmers large and small to produce more from their land while conserving more of our world’s natural resources such as water and energy” (Who We Are). Because of the controversy over genetically engineered seeds and their effect on the environment, as well as Monsanto’s continued presence in the media, the focus of the analysis that follows is on Monsanto and the effect of their corporate practices on GMO policy, the subsequent GMO issues, and finally the environmental policy effects.

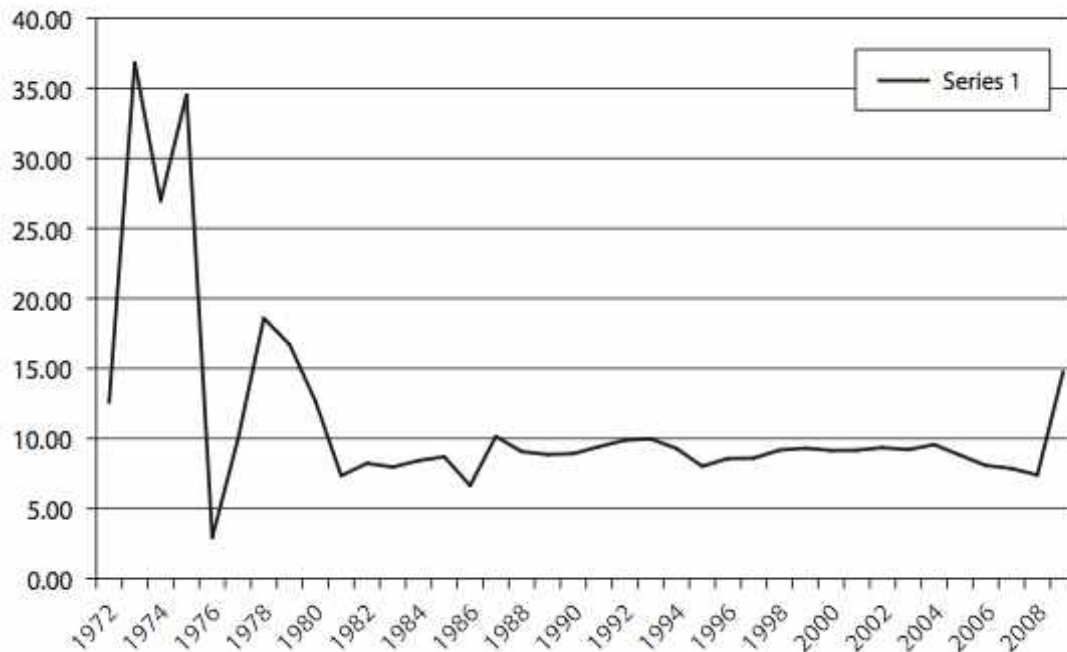
Monsanto, a St. Louis based company, started business in 1901, founded by John F. Queeny and his wife Olga Monsanto Queeny (ibid). They originally focused on the production of saccharine, and became a major supplier to Coca-Cola (Monsanto: A Corporate Profile). Monsanto began manufacturing agricultural chemicals in 1945, and created Agent Orange, “a defoliant contaminated with dioxin that was produced for the U.S. military during the Vietnam War” (ibid). Monsanto’s movement into the agricultural market occurred when their brands of propachlor and arachlor herbicides were approved for use in the 1960s. Around this time, Monsanto became the principal company supplying Agent Orange to the U.S. Military for use in the Vietnam War, from 1962-1971. In 1976 Roundup herbicide was approved for use on certain crops, and in 1982, Monsanto Scientists successfully genetically modified a plant cell, for the first time (ibid). About a decade later, in 1996, Genetically Engineered Roundup Ready soybeans, canola and cotton, as well as Bollgard insect-protected corn and cotton were introduced into the U.S. marketplace, shortly followed by Roundup Ready Corn in 1998 (ibid). In 2000, Pharmacia Corporation bought Monsanto Chemical Company. In 2002, Monsanto separated from Pharmacia and created its own agricultural sciences company, the Monsanto seen today (ibid).

Monsanto has gained a pretty negative image worldwide, for its tactics in ensuring patent protection, as well as reports of illegal international activity. In 2005 the Justice Department fined Monsanto \$1.5 million for bribing an Indonesian official (Hindo). Monsanto also has a long history of suing farmers for unauthorized use of its seeds, a strategy that has prompted many adversaries to label the company as a corporate bully (ibid). These are just a couple examples of the negative attention that Monsanto

garners. Perhaps the most recent outpouring of dissent for Monsanto occurred with the passing of the 2012 Farm Bill. In the bill, section 735, dubbed the “Monsanto Protection Act” by critics, gained much attention. The provision “allows farmers who use biotech seeds to keep planting them even if courts are reassessing whether the USDA followed protocol when it approved the seeds for use” (Fox). What was significant about the critique of this ‘Monsanto’ Rider is that it was attacked by both sides, both environmentalists, as well as market conservatives. Jacqueline Bodnar, communications director for the conservative-leaning think tank FreedomWorks said “We believe corporations should play by the rules of the free market like everyone else, instead of hiring insider lobbyists to rewrite the rules for them in Washington” (ibid).

Monsanto’s success can in part be associated with Neoliberal policies in the United States. Starting in the 1980s, with the election of Ronald Reagan as President, the United States began instituting more neoliberal policies, which called “for greater ‘individual responsibility’ to solve social problems” (Harrison). This has resulted in the “reductions of government expenditures for environmental programs, elimination of regulations and other so-called barriers to trade, devolution of regulatory responsibility to the local level, and shift by the state, industry, and many activists alike toward voluntary and market-based solutions to environmental problems” (ibid). As can be seen in Figure 4, below, neoliberal policies coincide with an overall decrease in government spending on regulatory policies administered by the federal Environmental Protection Agency. In the graph, the EPA’s budget in millions is documented for every year from its inception in 1972 until 2009.

Figure 4: EPA Budget (in \$ millions) 1972 through 2009



Source: Harrison, Jill Lindsey. *Pesticide Drift and the Pursuit of Environmental Justice*. Cambridge, MA: MIT, 2011. Print

“Investigative journalists and other researchers have shown how industry uses various direct and indirect tactics to shape policy, regulations, regulatory practice, and legal processes in its favor, and avoid liability for illness and injury” (ibid). Neoliberal ideas of small governments, reduced regulatory agency, and the United States’ history of valuing private property and intellectual property, have helped companies like Monsanto become extremely successful. It is through neoliberal policies that Monsanto has been able to effect GMO policy, which has in turn affected environmental policy.

Main Theories of Environmental and Public Health Policy in the U.S.

In the United States, both environmental and public health policies are based upon the risk assessment principle. In cases where there exists an unknown potential harm of human or environmental health, from the release of a chemical, action, process, technological innovation or planting genetically engineered crops, the government relies on an assessment of risk to decide if that process or action should proceed. In cases such as these where the science behind whether or not the action is safe or not, is incomplete, it usually goes forward. In other words, production and application of new technologies is generally allowed until and unless there is conclusive evidence to prove that harm exists. This has stimulated a debate over the use of risk assessment versus the use of the precautionary principle, and if the two should be intertwined.

Risk Assessment

Risk assessment is the main tool used by public health and environmental agencies in the United States. This is the “process of identifying and evaluating the potential for injury, damage or loss to human health and the environment as a result of exposure to the effects of a chemical, technology or project” (Armour). To determine risk, there are five types of analyses that have to be undertaken: hazard identification, exposure assessment, dose-response evaluation, risk characterization and risk management. Hazard identification is used to figure out if a hazard exists, or if there is a set of circumstances that exist with the potential to cause harm (ibid). Exposure assessment is then used to determine the likelihood, intensity and duration of human exposure to the hazards identified, which would take into account the worst-case or reasonable maximum exposure scenario (ibid). Dose-response evaluation is used to determine the relationship between the estimated magnitude of exposure and the probability of negative health effects occurring to an exposed population (ibid). Risk

characterization is used after the exposure assessment and the dose-response evaluations are done. The total exposure estimate, calculated in the exposure assessment, is multiplied by the potency estimate, calculated in the dose-response evaluation, which gives a final estimate of the risk for a given population (ibid). Risk management identifies and assesses the effectiveness of measures necessary to reduce risk, after the estimation of the probability of harm is determined (ibid).

While risk assessment and cost-benefit analyses have been methods to evaluate possible risks, quantitative risk assessment in regards to environmental and public health policy is recently new. It was developed in the early 1970s and 1980s to “systematically evaluate the degree and likelihood of harmful side effects from products and technologies” (Myers). While it was developed with the idea to strengthen the enforcement of environmental laws, it has become an extremely effective tool to reduce the power of environmental regulation (ibid). As this approach became the norm in the United States, corporate interests were able to insist that “harm must be proven ‘scientifically’ by a quantitative risk assessment demonstrating harm in excess of acceptable limits, before action could be taken to stop a process or product” (ibid). Here lies the hypocrisy of risk assessment when applied to GMOs. Corporate interests continue to argue for risk assessment to determine that there is harm, or potential harm, in excess of acceptable limits, but Monsanto will not allow outside, independent scientists to test and study the effects of their product on the environment and human health, claiming patent protection. This claim has been upheld in court cases ever since they won the right to patent a genetically modified organism. Nancy Meyers illustrates the deep moral implications of the current system in asserting, “The U.S. regulatory system was

subverted by commercial interests, with the encouragement of political leaders and, increasingly, the complicity of the court system” (Myers).

Precautionary Principle

The precautionary principle is primarily instituted in the E.U, but is a relatively new concept to environmental protection in the U.S. The basic idea of the precautionary principle as defined by the Pesticide Action Network (PAN) is “the concept that we must act to reduce potential as well as proven hazards, even in the face of uncertainty about the extent of these hazards. Among other things, this means taking action to eliminate exposures to potentially damaging substances” (Harrison). Or, as Thornton explains,

“The implications for policy are obvious: since science leaves so much unknown, we cannot afford to make risky bets on its predictions or wait to protect health and the environment until we know for certain that some substance or technological practice has caused injury. Instead, we should avoid practices that have the potential to cause severe damage, even in the absence of scientific proof of harm. This rule, called the precautionary principle, is common sense: and says that we should err on the side of caution when the potential impacts of a mistake are serious, widespread, irreversible, and incompletely understood” (Harrison).

While the precautionary principle is used primarily in the E.U, it does underlie many of the early environmental and public health legislation in the United States. This was illustrated in many of the laws and acts mentioned above: the former Delaney Clause of the Food, Drug and Cosmetics Act which prohibited the incorporation into processed food of any level of a substance that had been found carcinogenic in lab animals; the Clean Water Act, which established goals to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters”; and the Endangered Species Act, which requires the protection of threatened species beyond economic interests (Raffensperger). However, this precautionary approach has largely been put aside for risk assessments and cost-benefit analysis. “Much of the early precautionary nature of U.S.

environmental and occupational safety and health policy was lost during the 1980s, when the Reagan administration disarmed these protections” (ibid).

Summary

Under the broad context of neoliberalism in the United States, environmental regulations have been reduced, and the importance of private property (which includes intellectual property) has increased. This has allowed Monsanto, under the protection of its patents on GM seeds, to effect GMO policy, which has been played out in the Supreme Court, as well as in State legislatures. These GMO issues have thus altered the nature of environmental policy across the United States.

Specifics of Paper

Research Question

As primary actors in the economy, we expect large corporations to be paying attention to and influencing the development of public policy that affects their interests. Within the greater neoliberal context, which has argued for reduced government involvement in environmental issues, large corporations have been able to exert significant influence over environmental regulation. Some would argue that neoliberal free market principles have increased the influence of corporate efforts to direct public policy- in spite of opposing public views. As noted above, public opinion has consistently expressed support for environmental regulation and has also expressed a great deal of worry about issues such as air and water pollution. This gives rise to a couple of questions: First has Monsanto been able to influence GMO policy? The answer seems simple enough: Monsanto has a clear interest in advancing GMO policy that supports

their corporate interests and has had plenty of opportunity to act on those interests, drawing on legal precedents and economic resources. The second and more important question, and the focus of this analysis: Has GMO policy in the United States altered the core environmental policies that were enacted in the early 1970s?

Hypothesis

With the influence exerted by large corporations, specifically Monsanto, GMO policy in the United States has altered the core environmental policies that were enacted in the early 1970s. The environmental policies have been weakened, and in some cases ignored, to support corporate interests at the expense of environmental interests.

Methods

In order to test the hypothesis that the environmental policies that were enacted in the 1970s have been weakened to support corporate interests at the expense of environmental interests, Monsanto Corporation, the face of agricultural biotechnology, was selected as the focus of analysis. To be clear, there are other players in the development of agricultural biotechnology that share the interests of Monsanto, but Monsanto was selected as a representative of the shared corporate interests in promoting GMOs. The analysis provides a brief introduction of Monsanto, and then delves into their legal and lobbying efforts to affect GMO policy. The evaluation focuses on the effects of Monsanto efforts on both GMO development, and the administration of core environmental policies.

Legal Efforts to Support GMO Development

To test whether or not environmental policies have been altered to benefit corporate interests in the United States, I examined the most recent Supreme Court cases that dealt with agri-business giant, Monsanto. I chose to look for cases involving Monsanto because they have become the de facto face of genetically modified organisms and biotechnology firms, due to their constant place in the public's eye as the spokesman of genetically modified organisms. In the cases I examined the specific genetically modified organism under question was genetically modified seed.

The two cases that I examined were *Bowman v. Monsanto* (2013) and *Monsanto v. Geertson Seed Farms* (2010). In *Bowman v. Monsanto* (2013) the issue at stake was Monsanto's patent on Roundup Ready soybean seeds. The Supreme Court held unanimously that "Patent exhaustion does not permit a farmer to reproduce patented seeds through planting and harvesting without the patent holder's permission" (Bloomberg Law) In *Monsanto Company v. Geertson Seed Farms* the Court held 7-1 that "a lower court judge had incorrectly ruled when he banned the planting of genetically engineered because of claims they might be environmentally unsafe" (scotusblog).

In each case I focused on the opinions of the Court and the Amicus Curie briefs submitted on behalf of the petitioner and the respondent. I looked for specific criteria in each brief and opinion to quantify the number of times the Endangered Species Act, Clean Water Act or Clean Air Act were mentioned. Because no Amicus Curie Briefs directly mentioned the Endangered Species Act, Clean Water Act or Clean Air Act, I focused instead on any mention involving the main goal of each of the acts listed above. I focused on the main points of each Act, and was then able to record mention of similar goals of the Clean Water Act, Clean Air Act and Endangered Species Act. It is important

to mention again, that the Clean Air Act and Clean Water Act are focused on human health concerns, while the Endangered Species Act is focused on ecological and environmental health concerns. For the Clean Water Act, I looked for mention of water pollution as a result of genetically modified crop usage, usually as result of pesticide runoff. In the Clean Air Act I found no direct mention of pesticide use, so instead I focused in on health concerns of pesticide drift causing any harm to nearby areas. This correlation is derived from the central goal of the Clean Air Act; providing safe air quality for the people of the United States, and if there is any mention of pesticide drift from the use of GMOs and possible health concerns. The most popular environmental policy indirectly mentioned in the Amicus Curie Briefs was the Endangered Species Act. Here I focused on cross-pollination with wild or feral species. The Endangered Species Act was designed to identify species at heightened risk, protect them from further harm, and establish recovery programs (Waples, 726). Due to actual occurrence of genetic drift and cross-pollination due to genetically modified organisms, the goal of the Endangered Species Act, to protect species, is being ignored by proponents of GMO use. The consequences of cross-pollination with genetically modified organism have the potential to irrevocably harm local ecosystems and the environment. As a statement made by the Food and Agriculture Organization of the United Nations (FAO) said, “the loss of biodiversity will have a major impact on the ability of humankind to feed itself in the future” (Cummins).

Lobbying Efforts to Stem Anti-GMO Measures

GMO labeling measures brought forth in State legislatures offer the largest interaction between corporate and environmental interests. Cases such as these offer two completely different and distinct viewpoints, one for and one against GMOs. With the

advent of watchdog companies that track campaign donations, it has become easier to tell who is donating, and what they are donating for or against. In this case, using one of the watchdog companies, the National Institute on Money in State Politics, I was able to find the donations given by Monsanto, specifically against GMO labeling initiatives. By looking at each state that introduced a GMO labeling bill, corporate interests represented by donations made to ballot measure committees, and the corresponding result of the bill, I look to show the effectiveness of corporate interests over environmental interests.

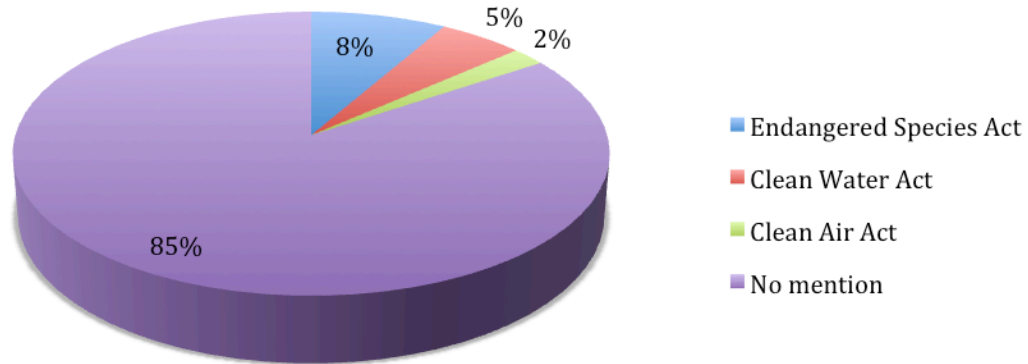
Results

Examining Monsanto's Success in the Judicial Branch

From *Bowman v. Monsanto* (2013) and *Monsanto v. Geertson Seed Farms* (2010) there were a total of thirty-two Amicus Curie Briefs. Each brief had the possibility of mentioning all three or some combination of the goals of the Acts that I examined, the Clean Air Act, Clean Water Act, and Endangered Species Act. In total there were a total of 96 (32 x 3) opportunities to mention the Clean Water Act, Clean Air Act and Endangered Species Act. After reading each brief, these Acts were mentioned a total of fifteen times, or 15.6% of the time. The Endangered Species Act was mentioned eight times, the Clean Water Act was mentioned five times, and the Clean Air Act was mentioned two times, illustrated in Figure 5, below.

Figure 5: Percentage of Monsanto Case Briefs Including Mentions of Key Environmental Issues Related to the Endangered Species Act, the Clean Water Act and the Clean Air Act.

Environmental Policy Inclusion



Source: Counts of environmental issues mentioned in briefs submitted to the U.S. Supreme Court in the cases *Bowman v. Monsanto* (2013) and *Monsanto v. Geertson Seed Farms* (2010).

The mention of the goals of the three acts, the Endangered Species Act, Clean Water Act and Clean Air Act, in the two court cases was surprising low. Only fifteen percent of the Briefs filed for the Court contained mention of these environmental laws. However, the results are likely also affected due to the specifics of the two cases, one dealing specifically with Patent Protection, and the other challenging the validity of an injunction made by a lower court that halted the planting of GM seeds until they complied with the guidelines set by the National Environmental Policy Act (NEPA) requiring an environmental impact statement. While the mention of the goals of the three acts was low, they were still mentioned. This gives rise to the conclusion that the goals of these

acts are being brought up in these court cases, where Monsanto and other biotechnology companies have had unparalleled success.

In both cases, *Bowman v. Monsanto* and *Monsanto v. Geertson Seed Farms*, the Supreme Court ruled in favor of Monsanto. This follows a trend of Monsanto consistently winning in the courts. “Monsanto has sued 146 U.S. farmers...since 1997, winning all 11 cases that went to trial, the company says” (Stohr). The biotech giant asserts that these wins are a reassurance of patent protection in the United States (ibid), but continued success of corporate interests, such as Monsanto, is a worrying trend. Monsanto is able to hide behind the patent and copyright clause of the Constitution, which states in Article I, Section 8, Clause 8 “The Congress shall have Power To...promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries” (Heritage). The protection afforded to biotechnology corporations under the patent and copyright clause is coming at the expense of environmental concerns.

In the two cases examined, mention of environmental consequences of genetically modified crops, both warning and denouncing, made up a small portion of the interested parties who filed Amicus Curie briefs. This shows that there is documented concern that environmental policies are not being very strongly enforced, and even ignored, allowing corporate interests to prosper.

In the Amici that were written on behalf of Monsanto, many asserted that the environmental impacts of Roundup Ready crops, in these cases, soybeans and alfalfa, were negligible on the environment. In Amici written by CropLife America they stress that there is no evidence of unwanted cross-pollination from genetically engineered

soybeans to conventional or organic soybeans (Brief for Croplife America as Amicus Curie Supporting Affirmance). The American Seed Trade Association takes a different tactic, proclaiming that genetically engineered crops, specifically Roundup Ready seeds, reduce pesticide use, increase crop yield, improve nutrition in certain staple foods, simplify weed control, and benefit the environment (Brief for The American Seed Trade Association as Amicus Curie Supporting Respondents). The American Soybean Association et al. asserted that genetically modified crops have triggered changes in agricultural production practices that improve soil conservation and water quality, reduce Green House Gas releases, improve carbon sequestration and reduce usage of persistent pesticides (Brief for the American Soybean Association et al. as Amici Curiae Supporting Respondents).

In both sets of Amicus Briefs written for Bowman and Geertson Seed Farms, there was significant worry over the dangers genetically engineered crops have on the surrounding environment. The Union of Concerned Scientists wrote that “The two most significant risks... are 1) the spread of unwanted transgenes to surrounding fields and wild plant populations and 2) the proliferation of herbicide-resistant weeds “ (Brief for The Union of Concerned Scientists et al. as Amici Curiae Supporting Respondents). While advocates for Monsanto largely focused on economic reasons for why the Court should rule in favor of Monsanto, the Cropp Cooperative brought to the attention of the Court the economic concerns of the organic produce market. With sales of certified organic products approaching \$25 billion, the dangers of cross-pollination can hurt these businesses both environmentally and economically (Brief for Cropp Cooperative et al. as Amici Curiae Supporting Respondents).

Based on these findings, there is a lot of uncertainty over the safety of genetically modified organisms on the environment and on public health. As was illustrated above, there are scientists on both sides of the argument conveying messages of warning as well as safety. Because of the United States implementation of the quantitative risk assessment strategy, these GM products are being introduced into the environment and the marketplace, without conclusive evidence supporting either set of scientists' claims.

Labeling as a Possible Way to Curb Monsanto's Power

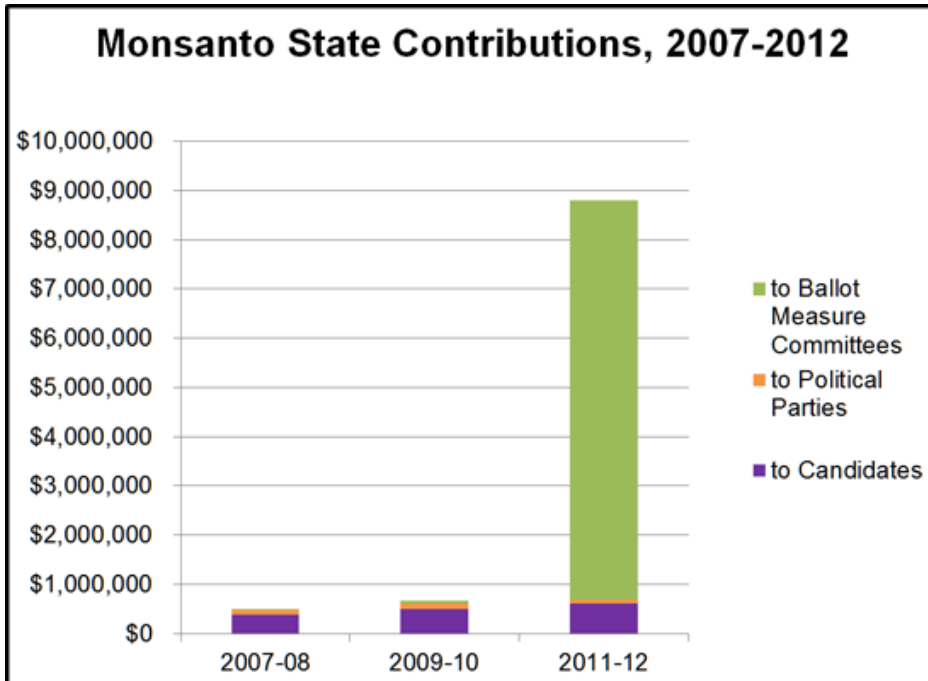
Monsanto and other large corporations have been remarkably successful in the courts of the United States. They present a David and Goliath matchup to any farmer or environmental group that attempts to curb their power. However, one possible weakness that Monsanto faces is exemplified in the labeling initiatives that are taking form in state legislatures all over America. Here, opponents of GMO's are attempting to mandate that foods that contain GMOs be labeled as such. They are playing on the public's general doubt on the safety of genetically modified foods. This is perhaps the most powerful weapon that opponents have in their arsenal.

In a poll conducted by the New York Times in 2013, it was found that, "93% of respondents (said) that foods containing such ingredients should be identified. Three-quarters of Americans expressed concern about genetically modified organisms in their food, with most of them worried about the effects on people's health" (Kopicki). This concern over the health effects of GMOs has turned into State Legislatures across the nation introducing bills that would either prohibit or require labels on GM foods. See Appendix A for a complete list of states where bills were introduced in 2013. Of the 54

bills introduced in 2013, coming from 26 states, 2 bills were enacted into law, Connecticut and Maine (Center for Food Safety).

As the labeling initiative gains more popularity, expect to see Monsanto's contributions to State candidates, political parties and ballot measure committees, continue its trend of rapidly increased spending. As seen below, when ballot measures to require labeling of GMOs started gaining popularity, so too did Monsanto's interest in supporting opposition figures to the bills. From 2008 to 2012, Monsanto's political contributions to all state campaigns grew 1,682 percent (National Institute on Money in State Politics). It is also worth noting that of the top 10 states receiving Monsanto contributions in 2012, 7 of them had or were in the process of making, GMO labeling initiatives; Missouri, Illinois, California (with Prop 37, see Appendix B for details), Iowa, Hawaii, Indiana and Washington (ibid). It is also worth noting the extent to which large agribusinesses went to in order to, in the case of Prop 37 in California, defeat the issue of GMO labeling. In California, the measure drew about \$55 million in contributions. Of that \$55 million, \$44 million was raised to oppose the measure. The top two donors to opposing committees with \$8.1 million and \$5.4 million given respectively by Monsanto and DuPont. Those two companies, combined, contributed more money to the opponents of the issue, then the combined total of the contributions raised by proponents of the bill (\$13.5 million to \$10,457,610) (ibid).

Figure 6: Distribution of money given by Monsanto to State legislatures



Source: "National Institute on Money in State Politics." *Names in the News: Monsanto*. N.p., n.d. Web. 18 Mar. 2014. <<http://www.followthemoney.org/press/ReportView.phtml?r=498&ext=1#tableid1>>.

Illustrated in the state level initiatives on GMO labeling is the extent to which Monsanto and other large agribusiness and biotechnology firms are going to, to exert undue influence on policy. They were able to defeat the initiative in California, but more states are raising initiatives to fight against Monsanto and other large agribusiness firms.

Conclusions and Final Thoughts

This analysis was done in order to answer the question: Has GMO policy in the United States altered the core environmental policies enacted in the 1970s? I hypothesized that GMO policy has altered the core environmental policies; The environmental policies have been weakened, and in some cases ignored, to support

corporate interests at the expense of environmental interests. I ran two tests, one testing corporate influence and success in the Supreme Court, and one testing corporate influence in State GMO labeling initiatives. By looking at Supreme Court Cases, specifically *Bowman v. Monsanto* (2013) and *Monsanto v. Geertson Seed Farms* (2010) I found evidence of corporate interests being protected over environmental interests. The protection provided by patent law is favoring corporate interests at the expense of environmental interests. When examining state initiatives to label GMOs, the results again support my hypothesis. Corporate interests have had undue success in pushing their interests at the expense of environmental, as well as public, interests. However, it looks like that trend might be changing, with success stories like Maine and Connecticut.

After looking at all the data, there is a correlation between Monsanto's influence on GMO policy in the United States, and the correlating influence on environmental outcomes. Monsanto has been able to outspend proponents of GMO labeling initiatives at the state level, but more and more states are bring the issue to the forefront. In the Courts, they have been able to assert Patent Protection to keep from divulging the necessary information to safely determine if their product is safe for the environment and for the public. They have thus, shaped GMO policy through the courts, have exerted influence in Congress, (The Monsanto Rider), as well as on the state level.

For future research I would suggest looking into Monsanto's influence in Congress, to research why it has fallen to the states to bring GMO labeling initiatives to the forefront of policy conversations, as opposed to at the federal level. I would be interested to see their contributions to candidates, and their corresponding views on issues such as the health of the environment and GMO labeling. While I don't think this

is likely, due to the history of patent protection specifically with GMOs, I would also suggest future research in providing clear evidence of whether or not GMOs are safe to the environment and public health. Once a body of scientists comes out supporting or denouncing GMOs, environmental policy can move forward.

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Appendix A: 2013 Legislation Introduced in State Legislatures to Prohibit or Require Labeling of GM Foods

This is a list of State Legislature bills introduced into state legislatures that would require labeling or prohibit genetically engineered foods- a total of 54 bills introduced in 26 states. This list was obtained from the Center for Food Safety.

Alaska

HB 215 Requires the labeling of foods, states that GE foods may not be labeled as "natural." Introduced by Representative Tarr, prefiled release 1/10/14.

HJR.5 Opposes AquaBounty's petition to commercialize GE salmon, requests further examination of GE salmon, and proposes a label of "genetically modified" to accompany the fish if approved. Introduced January 28, 2013 by Representatives TARR, Kawasaki, Austerman, Reinbold, Tuck, Kerttula, Kreiss-Tomkins, Nageak, Gara, and Peggy Wilson and February 21, 2013 by Senators WIELECHOWSKI, MICCICHE, ELLIS, GARDNER, EGAN, and DYSON. Unanimously approved by Representatives February 20, 2013; on to Senate.

Arizona

SB.1180 Considers any food entirely or partially produced by genetic engineering without the label "genetically engineered" or implies that the food is naturally grown or all natural as misbranding. Introduced January 24, 2013 by Senator ABLESER.

Colorado

HB.1192 The bill defines "genetically engineered" and requires a person selling, distributing, or offering for sale food in Colorado that he or she is aware contains genetically engineered material or was produced with genetically engineered

material to label the food as follows: "This product contains genetically engineered material or was produced with genetically engineered material". The bill exempts certain foods from the labeling requirement. Introduced January 31, 2013 by Representative LABUDA. Voted down 7-2 on February 21, 2013.

Connecticut

HB.6418 Requires labeling of genetically engineered foods. Introduced February 14, 2013 by Representative BUTLER.

HB.6519 Requires labeling of genetically engineered foods. Introduced February 27, 2013 by JOINT PUBLIC HEALTH COMMITTEE.

PASSED SENATE 5/22/13

PASSED HOUSE 6/3/13

PASSED SENATE 6/1/13

Signed into law 12/12/13

Florida

S.B. 558 / H.B. 1 Provides mandatory labeling requirements for genetically engineered raw agricultural commodities and processed foods made with or derived from genetically engineered ingredients; exempts specified foods, commodities, ingredients, and other substances from labeling requirements. Introduced 12/20/13

HB.1233/SB.1728 Provides mandatory labeling requirements for genetically engineered raw agricultural commodities and processed foods made with or derived from genetically engineered ingredients; exempts specified foods, commodities, ingredients, and other substances from labeling requirements;

provides for enforcement of labeling requirements; provides penalties and civil remedies. Introduced March 1, 2013 by Representative REHWINKEL VASILINDA and March 2, 2013 by Senator SACHS.
BOTH DIED IN COMMITTEE May 3, 2013

Hawaii

HB.174 Requires specific labeling for any food or raw agricultural commodity sold in Hawaii that contains or was produced with a genetically engineered material. Introduced January 18, 2013 by Representatives CARROLL, LOWEN, MIZUNO, Evans, and Souki. Passed second reading February 8, 2013 after amended to only apply to food imported from outside the state of Hawaii. Measure passed in House on March 5, 2013; on to Senate March 7, 2013.

HB.348 Requires genetically engineered food products that are sold, offered for sale, or distributed in this State to be labeled as such, with certain exceptions. Introduced January 22, 2013 by Representatives LOWEN and C. LEE.

SB.468 Establishes labeling requirements for any food or raw agricultural commodity sold in Hawaii that contains a genetically engineered material or was produced with a genetically engineered material. Introduced January 18, 2013 by Senators ENGLISH, CHUN OAKLAND, GABBARD, KEITH-AGARAN, RUDERMAN, SHIMABUKURO, SOLOMON, Galuteria, Green, Kahele, and L. Thielen.

SB.615 Prohibits the sale of genetically engineered fish or genetically engineered fish products in Hawaii unless appropriately labeled as genetically engineered or produced or partially produced with genetic engineering. Introduced January 18,

2013 by Senators GABBARD, RUDERMAN, Chun Oakland, Shimabukuro, and L. Thielen. Passed January 31, 2013 after amended; modified February 14, 2013 to refer only to genetically engineered whole foods; passed second reading March 15, 2013

HB.733/SB.1290 Requires the labeling of genetically engineered whole food sold in Hawaii. Introduced January 24, 2013 by Representatives WOOLEY, HANOHANO, ING, LOWEN, Belatti, Brower, C. Lee, Luke, McKelvey, Morikawa, and Nishimoto and Senators GABBARD, ENGLISH, GREEN, RUDERMAN, SHIMABUKURO, Chun Oakland, and L. Thielen.

SB.934 Requires genetically engineered food products that are sold, offered for sale, or distributed in Hawaii to be labeled as such, with certain exceptions, and establishes penalties for violations. Introduced January 24, 2013 by Senators GREEN, CHUN OAKLAND, RUDERMAN, and Shimabukuro.

SB.1329 Requires labeling of foods that have been genetically engineered, provides a penalty for violations, and authorizes private civil enforcement of the Act. Introduced January 24, 2013 by Senator GABBARD.

Illinois

SB.1666 Requires labeling of both whole and processed genetically modified foods above a specific percentage by weight. Sets forth provisions concerning applicability and the right of action for violations, damages, and attorneys' fees. Introduced February 13, 2013 by Senator KOEHLER.

HB.3085 Requires genetically engineered raw agricultural commodities and processed foods offered for retail sale to bear labels. Creates exemptions for

certain classes of products and requires the Department to annually publish a list of raw agricultural commodities commonly cultivated in a genetically engineered form. Introduced February 26, 2013 by Representative MELL.

Indiana

HB.1196 Provides that any food that is offered for retail sale is misbranded if it is not disclosed that the food is or may have been entirely or partially produced with genetic engineering and that a food that is genetically engineered or a processed food may not state or imply that the food is natural. Introduced January 10, 2013 by Representatives FORESTAL and SHACKLEFORD.

Iowa

SF.194 Provides labeling requirements to genetically engineered foods and establishes penalties. Introduced February 13, 2013 by Senator BOLKCOM.

Maine

LD.718 Requires disclosure of genetically engineered products in food or seed stock. Introduced February 26, 2013 by Representatives HARVELL, ALFOND, BEAR, BEAUDOIN, Beaulieu, Beck, Bennett, Boland, Briggs, Brooks, Campbell, Carey, Casavant, Chapman, Chase, Cotta, Crafts, Daughtry, Davis, Dickerson, Dion, Doak, Dunphy, Espling, Evangelos, Farnsworth, Fowle, Gideon, Gilbert, Gillway, Goode, Graham, Grant, Guerin, Hamann, Harlow, Hickman, Hobbins, Hubbell, Johnson, Jones, Jorgensen, Kent, Keschl, Kinney, Knight, Kruger, Kumiega, Kusiak, Lajoie, Libby, Longstaff, Macdonald, Macdonald, Maker, Malaby, Mastraccio, McCabe, McClellan, McGowan, Mclean, Monaghan-derrig, Moonen, Moriarty, Morrison, Nadeau, Nelson, Newendyke, Parry, Peavey

Haskell, Peoples, Peterson, Plante, Pouliot, Powers, Rankin, Reed, Rochelo, Russell, Rykerson, Sanborn, Sanderson, Schneck, Shaw, Short, Sirocki, Soctomah, Stanley, Stuckey, Tipping-spitz, Treat, Turner, Tyler, Villa, Volk, Wallace Dexter, Weaver, Welsh, Werts, Wilson, and Winchenbach and Senators CAIN, BOYLE, Collins, Craven, Dutremble, Gerzofsky, Gratwick, Hamper, Haskell, Hill, Jackson, Johnson, Lachowicz, Langley, Mazurek, Millett, Patrick, Plummer, Tuttle, and Whittemore.

PASSED

SIGNED INTO LAW 1/9/14

LD.898 Requires labeling of genetically engineered marine organisms. Introduced March 7, 2013 by Representative CHAPMAN.

Died Between Houses, Jun 14, 2013

Maryland

HB.903 Establishes that specified foods offered for retail sale in the State and produced with genetic engineering are misbranded if specified disclosure or labeling requirements are not met; establishing that specified requirements of the Act do not apply to specified foods, commodities, and beverages; etc. Introduced by Representatives GLASS, Dwyer, Ivey, Kipke, Morhaim, and Pena-Melnyk on February 7, 2013. Withdrawn February 26, 2013 due to unfavorable report by Health and Government Operations.

Massachusetts

HB.808 Requires labeling of genetically modified foods in the following categories: foods in whole or in part produced by GE microorganisms, plants, or

animals with a 0.1% threshold; food products prepared or processed with genetic engineering, even if the GE organism is not present in the final product; foods derived from GE agricultural inputs, even if the GE input is not present in the final product; all meat and dairy products derived from animals fed GE products or treated with GE products; GE foods that have altered nutritional value; for foods with transgenes from other species, disclosure of the species and the gene(s); and for plants with transgenes from animals, disclosure of the fact for vegetarians. Establishes a penalty of up to \$1000 for violations. Introduced January 22, 2013 by Representative SMOLA.

HB.1936 Requires all whole and processed foods produced with genetically engineered materials to be labeled and classifies a lack of label as misbranding. Introduced January 22, 2013 by Representatives DiNATALE, Lewis, Smizik, Pignatelli, Provost, Scibak, Hogan, Andrews, and Dykema and Senator Tarr.

HB.2037 Requires labeling of all genetically modified foods, considers a “natural” label on GE foods as misbranding, and establishes exemptions. Introduced January 22, 2013 by Representative MORAN.

HB.2093 Provides for the labeling of genetically engineered foods. Introduced January 22, 2013 by Representatives STORY, Provost Mark, Kocot, Brownsberger, Sannicandro, Scibak, and Madden and Senator Farley-Bouvier.

Minnesota

HF.850/SF.821 Requires labeling for disclosure of genetically engineered food and seed. Introduced February 21, 2013 by Representatives CLARK,

HAUSMAN, LAINE, SLOCUM, S. JOHNSON, and KAHN and February 28, 2013 by Senators MARTY and Hawj.

Missouri

S.B. 533 seeks to require the labeling of all genetically modified meat and fish raised and sold in the state. The bill was introduced by State Senator Jamilah Nasheed (D), and had its first reading 1/8/14.

HB.245 Requires all food and food products sold in Missouri that are or contain genetically modified products to be labeled indicating that the food is or contains genetically modified products. Introduced January 30, 2013 by Representatives ELLINGTON, Webb, Montecillo, Hummel, Newman, Rizzo, Ellinger, Gardner, Dunn, LaFaver, and Walton Gray. Withdrawn February 14, 2013.

SB.155 This act requires all genetically modified meat and fish that is raised and sold in Missouri to be identified on its label as genetically modified. Introduced January 16, 2013 by Senator NASHEED. Dead.

Nevada

AB.330 Provides for the labeling of some genetically modified crops. Introduced March 18, 2013 by Representatives AIZLEY, OHRENSCHALL, Bobzien, Martin, and Spiegel.

New Hampshire

HB.660 Requires the labeling of genetically engineered foods and agricultural commodities. Introduced January 3, 2013 by Representatives MANN, Massimilla, Perry, Smith, and Raymond. Retained in committee February 28, 2013

1/22/14 Failed in House by a vote of 185-162

New Jersey

AB.2955/SB.1367 Requires labeling of foods containing genetically modified material. Introduced May 21, 2012 by Representatives WOLFE, KEAN, and Caride and February 6, 2012 by Senators SINGER, VITALE, A.R.Bucco, Cardinale, Lesniak, Turner and Bateman.

AB.3192 Requires labeling of all foods containing genetically modified material. Introduced July 30, 2012 by Representatives STENDER, EUSTACE, WOLFE, DeCROCE, Caputo, and P. Barnes III.

New Mexico

SB.18 Requires the labeling of food and commercial seed that contains genetically modified material and provides for measurement, quantification, and investigation of genetically modified material in food and commercial feed. Introduced January 9, 2013 by Senator WIRTH. Voted down Jan 31, 2013.

New York

AB.3525/SB.3835 Provides for the labeling of food or food products that contain a genetically modified material or that are produced with a genetically modified material, imposes penalties for false labels and misbranding, and sets forth exemptions. Introduced January 28, 2013 by Representatives ROSENTHAL and Peoples-Stokes and February 21, 2013 by Senator LaVALLE.

AB.5412 / SB.4468 Requires labeling of all genetically modified foods, considers a “natural” label on GE foods as misbranding, and establishes exemptions.

Introduced February 26, 2013 by Representative ABINANTI, and April 3, 2013 by Senator PARKER.

Oregon

HB.2175 Makes foods that contain or are produced using genetically engineered material subject to labeling requirements and declares that such foods that do not conform with labeling requirements to be misbranded. Introduced January 13, 2013 by Representative BOONE.

HB.2532 Makes foods that contain or are produced using genetically engineered material subject to labeling requirements. Introduced January 13, 2013 by Representatives HOLVEY, Buckley, and Keny-Guyer.

HB.3177 Establishes that genetically engineered fish may not be sold, displayed for sale, or offered for sale at retail for human consumption unless there is readily visible in the area where the fish is sold, displayed, or offered a sign disclosing that the fish has been genetically engineered; exempts restaurants; and sets penalties for misbranding. Introduced February 22, 2013 by Representatives HOLVEY, GOMBERG, and BOONE.

Pennsylvania

SB.653 Provides for the labeling of genetically engineered foods. Introduced March April 3, 2013 by Senators LEACH, Wozniak, Brewster, Fontana, Greenleaf, Farnese, Solobay, Ferlo, Hughes, Smith, Washington, and Yudichak.

Rhode Island

H.B. 7042 Sponsored by Democratic Rep. Dennis Canario, would require food and seed that contains more than .09 percent GMO ingredients to be labeled. The bill further defines “natural” to mean GMO-free. Introduced 1/9/14

HB.5278 Requires that food and food products derived from or containing genetically modified organisms be labeled as such by the manufacturer, retailer, or other person before putting it on the market for sale in Rhode Island.

Introduced February 6, 2013 by Representatives HULL, GIARUSSO, SHEKARCHI, MACBETH, and HANDY.

04/24/2013 recommended measure be held for further study

HB.5849 Requires that food or food products produced or made in RI only, derived from or containing genetically modified organisms be labeled as such by the manufacturer, retailer, or other person before putting it on the market for sale in RI. Introduced March 6, 2013 by Representatives BALDELLI-HUNT and HULL.

04/24/2013 recommended measure be held for further study

Tennessee

SB.894/HB.1168 Provides for the labeling of genetically engineered foods.

Introduced February 4, 2013 by Senator NICELEY and February 13, 2013 by Representative TOWNS.

Vermont

H.B.112 Provides for the labeling of genetically engineered foods. Introduced January 29, 2013 by Representatives WEBB, BARTHOLOMEW, ZAGAR, PARTRIDGE, MCCULLOUGH, BISSONNETTE, BURKE, BUXTON, CARR,

CHENEY, CHRISTIE, CROSS, DAKIN, DEEN, DEVEREUX, DONAHUE, NORTHFIELD, DONOVAN, ELLIS, EMMONS, FRANK, FRENCH, HEAD, HOOPER, KEENAN, KROWINSKI, LANPHER, LENES, MAREK, MARTIN, MARTIN, MASLAND, MCCARTHY, MCCORMACK, MILLER, MROWICKI, NUOVO, PEARSON, PELTZ, RACHELSON, RAM, SHARPE, SPENGLER, STEVENS, STUART, TILL, TOLENO, TOWNSEND, WAITE-SIMPSON, WIZOWATY, and WOODWARD. Passed by House May 10, 2013; Bill in Senate January 2014

S. 289 Would make manufacturers and growers of GMO crops liable for trespassing and damages should their seed drift into other fields. Introduced 1/7/14 by Senator French.

SB.89 Provides that food is misbranded if it is entirely or partially produced with genetic engineering and it is not labeled as genetically engineered. Introduced February 8, 2013 by Senators BARUTH, ASHE, FOX, GALBRAITH, LYONS, MCCORMACK, POLLINA, RODGERS, and WHITE and Representatives Zuckerman and French.

Washington

H.B. 2143 A bill to label genetically engineered finfish in Washington State. Introduced 1/6/14 by Representatives Condotta, Pollet, and Van De Wege.

S.B. 6184 A bill to label genetically engineered finfish in Washington State. Introduced 1/17/14 by Senators Chase and Kline

Initiative I-522, the People's Right to Know Genetically Engineered Food Act.

SB.5073 Provides for the labeling of genetically engineered foods and prescribes penalties for violation. Introduced January 17, 2013 by Senators CHASE, Kline, Keiser, Rolfes, and Hasegawa. In November 2013, I-522 was narrowly defeated, 49-51%.

West Virginia

HB.2153 Sets forth labeling requirements regarding the sale of foods containing genetically engineered materials and foods produced with genetically engineered materials; provides exceptions; requires testing; provides civil penalties; provides for civil suits by the Commissioner of Agriculture and suits by citizens; defines terms; and provides rule-making authority. Introduced February 13, 2013 by Representative MANYPENNY.

H.B. 2145 creating the "Genetically Engineered Crop and Animal Farmer Protection Act"; making legislative findings; setting forth information requirements regarding the sale of genetically engineered seeds; plants and animals; identifying certain contractual provisions to be against public policy; preventing noncompetitive practices involving technology fees; establishing measures to be taken to avoid cross pollination of genetically engineered plants and seeds; requiring genetically engineered seeds to be so labeled; prohibiting loan discrimination; providing penalties; providing for civil and citizen suits; defining terms; and authorizing rule-making. Introduced 2/13/13.

H.B. 2207 creating the "Genetically Engineered Organism Liability Act"; making legislative findings; creating liability for injuries arising from the release of

genetically engineered organisms into the environment; providing that liability is nonwaivable; and defines a term. Introduced 2/13/13.

Appendix B

This is a summary of California's initiative in 2012 to label GMOs. It ended up failing, but was seen as the first step towards states initiatives to label GMOs. This information was received from followthemoney.org.

California Prop 37

Prop 37, would have made California the first state in the nation to require GM foods to be labeled on the packaging. It mandated labeling of raw or processed food offered for sale to consumers, if the food is made from plants or animals with genetic material changed in specified ways. The bill would have also prohibited labeling or advertising such food as "natural"