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Title:

*“Overview of the Clean Water Act
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Overview of the Clean Water Act and Its Economic Ramifications

The Clean Water Act originated within the Federal Water Pollution Control Act (FWPCA) amendments of 1972 (Bell et al). The impetus for the creation of the Clean Water Act was the Cuyahoga River which repeatedly caught fire as a result of the severe water pollution in the river ("Cuyahoga River Fire"). The initial goal of the Clean Water Act was to "eliminate all discharges of pollutants in the nation's waterways by 1985" (Salzman & Thompson). The United States government has since spent over \$1 trillion to contain and eliminate water pollution.

A debate over the effectiveness of the Clean Water Act has been long held by environmentalists and economists. A major component of this debate rests in the externalities of the legislation. A positive externality is defined as "a gain realized by someone other than the buyer or seller of the good" (Matthews & Patrono). The Clean Water Act has a positive externality by increasing the total social welfare of the American people. The debate rests in balancing the benefits of the Clean Water Act with the costs. However, sometimes government regulations, particularly ones without a clear endpoint, can become intrusive in the lives of the American people.

The amendments required the Environmental Protection Agency (EPA) to set nationwide limits on discharge from industrial sources and publicly owned treatment facilities into navigable waters of the United States. More amendments were added to the Federal Water Pollution Control Act as years passed, and the FWPCA became known as the Clean Water Act (Bell et al). There are three pillars of the Clean Water Act. They established nationwide limits for discharge from industrial sources and

publicly owned facilities into navigable waters, set effluent limitations for certain sources, and established the NPDES permit program (Bell et al).

The Clean Water Act details specific methods of enforcement when a violation is committed. Cleanup enforcement occurs when there is a discharge or spill of a prohibited substance into a navigable waterway as defined by the Clean Water Act. Cleanup is enforced by identifying the parties responsible for the contamination, negotiating with them to perform the cleanup themselves, ordering them to perform the cleanup themselves, or forcing them to pay for the cleanup performed by another party or the Environmental Protection Agency (EPA). This enforcement is applicable to government agencies as well as privately owned companies.

Federal facilities enforcement, specifically, ensures federal facilities comply with environmental regulations and statutes. The Environmental Protection Agency is the federal branch responsible for Clean Water Act enforcement within the United States. Beyond the federal level, there is a Clean Water Act Compliance Monitoring program which brings together federal, state, local, and tribal regulatory agencies to work together.

Civil administrative actions are “non-judicial enforcement actions taken by the EPA or a state under its own authority” (EPA). These actions do not involve a judicial court process. Actions taken by the EPA or the state may be in the form of a notice of violation or a Superfund notice letter or an order, with or without penalties, directing an individual, business, or other entity to take action to come into compliance or to clean up the site (EPA).

Civil judicial actions are formal lawsuits filed in court against persons or entities that have failed to: comply with statutory or regulatory requirements, comply with an administrative order, pay the EPA the costs for cleaning up a Superfund site or commit to doing the cleanup work (EPA). These lawsuits are filed by the United States Department of Justice on behalf of EPA if the enforcement is under federal jurisdiction. Otherwise, the lawsuits are filed by the state's Attorney General on behalf of the states (EPA).

The aforementioned 'Superfund' was passed by Congress in 1980 as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (EPA). CERCLA provides the funding for the cleanup and remediation of hazardous sites. The Superfund's goals are to protect human health and the environment, make responsible parties pay for cleanup work, involve communities in the Superfund process, and return Superfund sites to productive use (EPA).

Enforcement under the Clean Water Act is divided into two main categories: civil enforcement and criminal enforcement. Most cases of enforcement fall under the civil protocol. Civil enforcement can result in settlements, civil penalties, injunctive relief, or supplemental environmental projects (EPA). Settlements are agreed upon resolutions that often contain consent agreements or administrative orders on consent (EPA). For judicial actions, consent decrees must be signed by all parties to the action and filed in court (EPA). Civil penalties are monetary assessments paid by a person or regulated entity as a result of a violation or noncompliance. These act as an incentive for persons to come into compliance or remain in compliance. Civil penalties are designed to recover the economic benefit of noncompliance as well as to compensate for the

violation (EPA). Injunctive relief requires a regulated entity to perform or stop performing a designated action in order to bring them into compliance. Supplemental environmental projects (SEPs) and mitigation can be included as part of a settlement. SEPs are environmental improvement projects that a violator voluntarily agrees to perform (EPA). SEPs are in addition to actions required to correct the violations specified in the settlement. Mitigation is additional injunctive relief to reduce or offset harm caused by violations of the Clean Water Act (EPA).

Criminal enforcement includes criminal penalties and incarceration as a result of a court conviction. Criminal penalties are federal, state, or local fines imposed by a judge at sentencing. Violators may be ordered to pay restitution to those affected by their violation (EPA). Criminal actions are typically reserved for the most serious violations, specifically those that are willful or knowingly committed.

The Clean Water Act has six major components that are granted protection. They are wastewater management, pretreatment, storm water pollution, animal waste from concentrated animal feeding operations, spills of oils and hazardous substances, and the discharge of dredge and fill material into wetlands. Wastewater management falls under the Clean Water Act's national pollutant discharge elimination system (NPDES) program. Within the NPDES, the EPA regulates the discharge of pollutants from municipal and industrial wastewater treatment plants, sewer collection systems, and storm water discharge from industrial facilities and municipalities ("Water Enforcement"). Essentially, the NPDES regulates point source pollution of waterways. Non-point source pollution is not addressed in the Clean Water Act though it causes major damage to waterways. Enforcement of the NPDES program is overseen by the EPA, but state

governments are given the rights to permit and enforce aspects of the program (“Water Enforcement”). At this time, forty-six states and one territory are authorized to carry out the NPDES program (“Water Enforcement”).

Pretreatment ensures that industries and municipalities pre-treat pollutants to protect local sanitary sewers and wastewater treatment plants (“Water Enforcement”). Pretreatment allows for the problem, the discharge of pollutants, to be addressed before they enter treatment facilities. Wastewater treatment plants could be damaged by the pollutants, or the pollutants may pass through the treatment facility unnoticed, leading to their discharge into waterways. The last aspect of the pretreatment program handles various recycling options for municipal sludge and wastewaters.

Storm water pollution is most often a result of storm water runoff. The runoff most often occurs after heavy rainfalls or periods of prolonged precipitation. The primary concern with storm water runoff is a result of storm water picking up debris and pollutants as it travels into a municipal water system or a natural body of water. The EPA has granted permitting privileges to local and state authorities to oversee storm water runoff and implement best management practices to prevent degradation of resources. These agencies inspect construction sites, industrial plants, and city streetways to ensure best management practices are being utilized.

Another consideration of the Clean Water Act is concentrated animal feeding operations (CAFOs). CAFOs are defined as a facility where animals will be confined for a 45 day or more period within a twelve-month span or a facility containing crops or vegetation which is not sustained during the normal growing season (“Water Enforcement”). CAFOs are monitored under the Clean Water Act because they are

considered a point source for pollution. Wastewater from CAFOs pose a dangerous threat to water quality if the facility and its runoff is not properly maintained.

Oil and hazardous waste spills frequently come to mind when one imagines threats to water quality. Therefore, it follows that such spills are very closely monitored by the Clean Water Act. In fact, it is one of the EPA's top priorities to "prevent, prepare for, and respond to oil spills that occur in and around inland waters of the United States" (EPA). The Deepwater Horizon oil spill, which occurred in 2010, led to the largest environmental settlement in United States history (*Deepwater Horizon oil spill settlements: Where the money went: National Oceanic and Atmospheric Administration 2017*). Civil and criminal cases were pursued under the Clean Water Act. The civil and criminal cases resulted in more than \$20.8 billion in fines. Most of the money from the lawsuits was directed to funds to restore the Gulf of Mexico, where the oil spill occurred, as well as to national entities like the U.S. Fish and Wildlife Service to reallocate resources to reduce the risk of a future disaster (*Deepwater Horizon oil spill settlements: Where the money went: National Oceanic and Atmospheric Administration 2017*).

Lastly, the discharge of dredge and fill material into wetlands is monitored by the EPA. Discharge into the wetlands is strictly forbidden unless there is a specific permit issued by the Army Corps of Engineers. The EPA closely monitors wetlands to ensure proper measures are being followed. If violations occur, the EPA will intervene with the necessary enforcement action.

Most policy decisions are made with insight given through cost-benefit analyses. Environmental policies are different because a cost-benefit analysis is not as

straightforward as in other cases. Benefits reaped from environmental regulations are difficult to evaluate monetarily. How can one quantify the monetary value of clean drinking water? Even more difficult, the value of a clean stream for recreational fishing? Thus, there are many externalities to consider when evaluating the cost of clean water. This is the problem faced by environmental economists worldwide. A few solutions have been proposed for remedying this problem.

A prolonged study is required to evaluate the costs of the Clean Water Act. It takes 2 to 10 years from the time a grant is received until the construction is complete per the EPA. It was determined that “grants significantly decreased pollution for 25 miles downstream, and these benefits last for around 30 years,” (Keiser & Shapiro). Therefore, any cost benefit analysis must take into account factors over the span of at least 10 years.

One of the chief goals of the Clean Water Act was to make waterways fishable. It was found that between 1972 and 2001 the amount of waterways that met standards for fishing increased by 12 percentage points (Keiser & Shapiro). Analyses found that it costs approximately \$1.5 million (\$2014) yearly to make one mile of river fishable (Keiser & Shapiro). To expand upon the value of fishable rivers as well as the value of clean waterways to nearby residences, a survey was conducted by Keiser and Shapiro. They found the largest estimated benefit to cost ratios are for locations where outdoor fishing or swimming is common, high-amenity urban regions, and in the South (Keiser & Shapiro). Larger benefits are also obtained from more populated areas. This information could provide insight into where grants should be given to maximize benefits.

A main concern by environmentalists and economists alike is the lack of regulation for nonpoint sources in the CWA. The CWA does not regulate nonpoint pollution, rather it leaves it to the discretion of the states (Salzman & Thompson). Nonpoint pollution is the main problem in waterways today, so it stands to reason that leaving water pollution regulation to the states is not beneficial. Nonpoint pollution surpassed point source pollution as the largest contributor to water pollution in the United States by the mid 1980s (Salzman & Thompson). Congress attempted to enforce the regulation nonpoint source pollution by adding a provision to the CWA in 1987. However, the provision does little to actually require states to monitor nonpoint source pollution and has therefore been ineffective.

The Environmental Protection Agency's operating budget and number of employees can be studied as a means of measuring the changes in government involvement. The Clean Water Act is certainly not the only policy or concern of the EPA, but it does warrant a significant portion of the EPA's time and money. The data published on the EPA's website is in nominal dollars. Due to the high rates of inflation in the United States from 1972 to 2020, it is more meaningful to study the number of employees. Since 1972 the number of employees has raised from around 8,000 to approximately 14,000 (EPA). Yet the number of employees has been fairly stable since 1990. This makes sense as the majority of environmental legislation was passed in the 1970s and 1980s.

The ultimate challenge created by the Clean Water Act, as well as any other national policy, is determining how much government intervention is necessary. Pundits will argue on either side of this issue for ages. However, a careful analysis of the facts

allows one to reasonably examine the good and the bad of the Clean Water Act. Keiser and Shapiro noted that water pollution was declining rapidly in the decade prior to the passage of the Clean Water Act (1972). One must be careful, though, to dismiss the need for the legislation as the precursors to the Clean Water Act were the impetus for some of that change. The dissolved oxygen deficit and shares not fishable of waterways have both decreased overall since the passage of the Clean Water Act (Keiser & Shapiro). As two major measures of water pollution, it leads to the conclusion that the Clean Water Act has been successful in its pursuit of remediating water pollution.

Figure 1. *Image of the Cuyahoga River on fire which kickstarted the push for the Clean Water Act.*



Figure 2. Chart of the EPA's operating budget and number of employees from 1970 to 2019 in nominal dollars ("EPA's Budget and Spending").

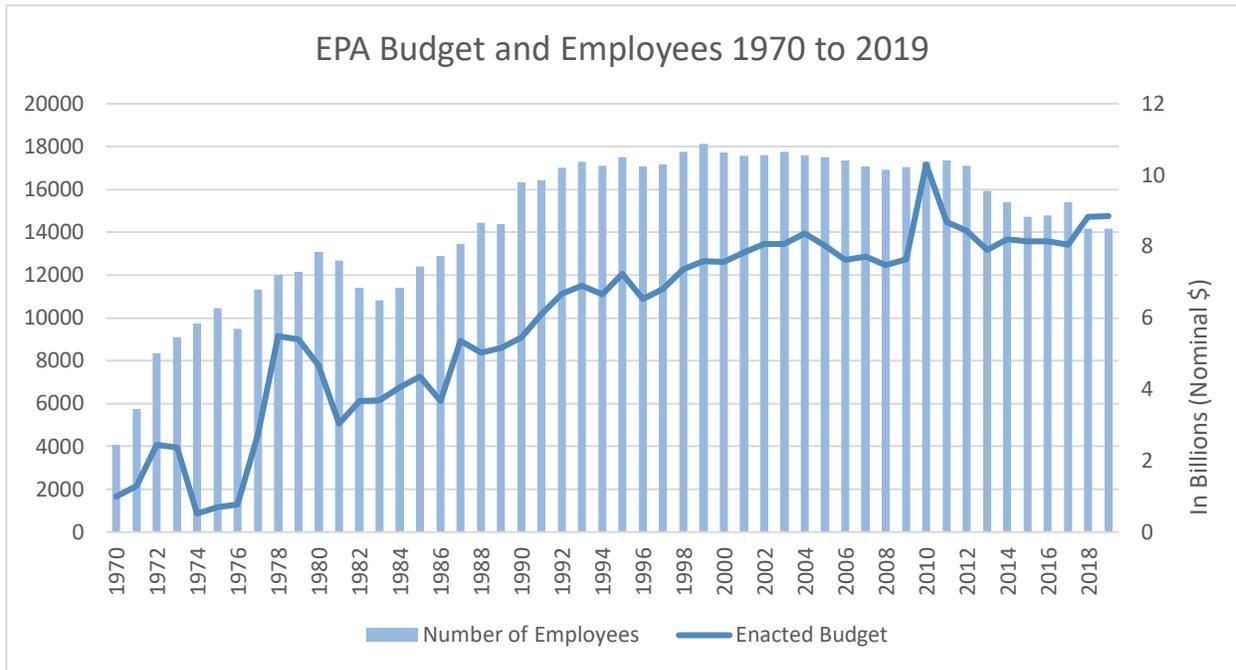
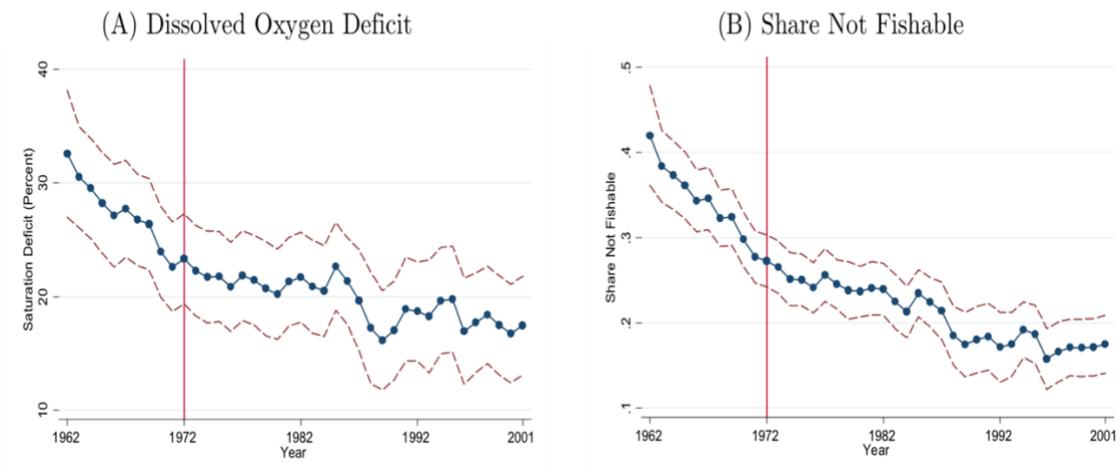


Figure 3. Water pollution trends with a red line indicating the creation of the Clean Water Act (Keiser & Shapiro).

Water Pollution Trends, 1962-2001



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