THE | C. BOYDEN | GRAY | CENTER

Transformation of Congressional Lawmaking by the Clean Air Act Amendments of 1970 and Its Effects

Frank T. Manheim

CSAS Working Paper 20-19
First Branch, Second Thoughts — What Is Congress's Proper Role in the
Administrative State?

Antonin Scalia Law School
C. BOYDEN GRAY CENTER FOR THE STUDY OF THE ADMINISTRATIVE STATE
George Mason University

TRANSFORMATION OF CONGRESSIONAL LAWMAKING BY THE CLEAN AIR ACT AMENDMENTS OF 1970 AND ITS EFFECTS

By Frank T. Manheim[1][2]

ABSTRACT

From the 19th Century to the early 1970s the U.S. was consistently at the frontier of publicly relevant technology and policy advances. The *Clean Air Act Amendments of 1970* (CAA) continued this tradition. However, the CAA transformed conventions for Congressional lawmaking in ways that had unintended negative effects on federal government operations, environmental management, and U.S. society.

The CAA's bipartisan framers came together at a time of environmental crisis and skepticism over federal regulators' stewardship over the nation's environment. Manufacturing and industry were prime sources of pollution. The framers feared that the formers' economic and political power would influence regulators. The CAA therefore broke previous norms for lawmaking by giving the Environmental Protection Agency comprehensive national authority over air pollution and prescribing operational detail. In effect, Congress became the sheriff and the Environmental Protection Agency became the summons server for environmental policy.

With powerful teeth, the CAA of 1970 and subsequent laws influenced by CAA precedents achieved rapid progress in controlling pollution. However, they replaced trust in federal agencies and cooperation between government and the private sector by regulations and punitive provisions, arousing antagonism in the business community. The results included deindustrialization, with mass exodus of business from manufacturing; litigiousness; barriers to innovation in environmental technology and policy; and perpetual battle over environmental regulation. Attempts by business and conservative-linked groups to reform regulatory policy were unsuccessful because they mainly sought inhibitions on the regulatory process. They failed to consider deep concerns of the environmental community and fundamental flaws in the regulatory system.

INTRODUCTION

The rise and fall of publicly relevant advances in the U.S.

From the 19th Century to the early 1970s the U.S. was consistently at the frontier of

[1] Affiliate Professor, Schar School of Policy and Government, George Mason University.

[2] Paper revised from presentation at the C. Boyden Gray Center for the Study of the Administrative State: "First Branch, Second Thoughts – What is Congress's Proper Role in the Administrative State?", Mar. 5-6, 2020

scientific, technological and policy advances relevant to the public. A Congressionally-authorized, 11-year study of the hydrology of the Mississippi River, conducted by Andrew Atkinson Humphrey in 1861, was hailed in Europe as a major breakthrough in hydrographic science (Reuss, 1999). The Morrill Act of 1862, signed by President Lincoln in the midst of the Civil War, promoted agricultural science in land grant colleges on the model of German science universities. Congress authorized Yellowstone Park as the nation's and world's first national park in 1872.

U.S. federal agencies gained global recognition for topographic and geologic mapping, water supply science and applications, and public health management. The electrical illumination of cities was initiated in New York City in 1882 by Thomas Edison (Baldwin, 1995), and the U.S. was the first nation to overcome space constraints in crowded cities through the construction of skyscrapers. The Chrysler Building, still a jewel in the New York skyline, was completed in 1930 after 20 months of construction without loss of a worker. It was then the world's tallest building (Ranogajec, 2020).

The above and other advances required effective operation and mutual trust on the part of federal, state, and municipal agencies, and the private sector. This was sustained in critical public service activities even though the political establishment might be tainted with veniality and corruption. Two theses in this paper are that 1) the era of efficiency and cooperation ended abruptly after 1970; and 2) the change was caused in large part by transformation of Congressional lawmaking conventions that had existed from 1900 to 1970. The impetus and model for this transformation was the groundbreaking *Clean Air Act Amendments* of 1970 (CAA). The changes involved complex, contradictory interactions between Congress and federal executive agencies. Recent controversies regarding those interactions include Congressional non-delegation doctrine.

Enacted in response to a national crisis over management of the environment, the CAA and subsequent laws in the 1970s achieved rapid progress against pollution and health hazards. The rigorous new environmental management system gained ardent approval and commitment on the part of the environmental movement. However, as this paper details, unanticipated results of the CAA influenced subsequent laws and led to a rift in American society.

Forgotten developments in the 1970s continue to exercise profound influence on U.S. society

Until the onset of the global coronavirus pandemic in 2020, the U.S. enjoyed an economic upswing led by record stock market indices and 50-year lows in unemployment (3.5% in December 2019, according to the Bureau of Labor Statistics). However, this masked longstanding political instability. This paper emphasizes the absence of partisan polarization over environmental policy in the early 1970s. However, the nation subsequently developed political conflict of an intensity not seen since prior to the Civil War. Congressional gridlock has made it impossible to update 30-to 40-year old environmental laws. Polarization has blocked meaningful attention to major national problems like deteriorated infrastructure, immigration policy, out-of-control health care and higher education costs, and progress against climate change. The U.S. is the near the bottom of all advanced nations in percent of renewable vs. total energy use.[3]

[3] The U.S. is second to China in CO2 emissions but in 2019 its ratio of renewable to total energy

Deindustrialization and ensuing income inequality have left a large fraction of young people facing poorer economic futures than that of their parents (Chetty, 2017). Conflict rages over global climate change policy (Garrard, 2019; Moran, 2015; USCRP, 2018). The Obama and Trump administrations adopted opposed energy and environmental policies (Davenport and Rubin, 2017)

I suggest that without seeds of destruction unintentionally incorporated in the 1970s laws the U.S. would not have lost most of its manufacturing base[4] . It would today lead in breakthroughs against global climate change by coordinating cooperative national programs *with* industry rather than imposing them on or pitting them *against* industry.

Gro Harlem Brundtland, former Norwegian environmental and prime minister and chair of the key 1987 U.N. Commission Report (Brundtland, 1987) warned that if both economics and environment were not integrated in policy, their advocates would talk past each other and neither would achieve their goals. In contrast with its earlier traditions, that is exactly what has happened to the U.S. Fundamental features of American society that give rise to such developments were perceptively identified 180 years ago by the famous French student of American Democracy, Alexis De Tocqueville. He wrote:

> "*The omnipotence of the majority and the rapid and absolute manner in which its will is executed in the United States not only make the law unstable, but also exercises the same influence on the execution of the law and on the action of public administration"* (Toqueville, 1835)*,* v. II, p. 408).

The changes in society and governance referred to above are nontrivial. To better understand them relevant historical background is provided in the next section. Instead of reviewing diverse and often contradictory arguments about polarization, evolutionary trends in the U.S. economy and environmental policy, this paper shows that a variety of key economic and societal developments show fundamental change in U.S. around 1970. The sharpness of the changes and their coincidence with the passage of the Clean Air Act Amendments of 1970 supports the argument that the CAA catalyzed a major transformation in U.S. society.

HISTORICAL TRENDS IN FEDERAL AGENCY OPERATIONS AND CONGRESSIONAL LAWMAKING

There is a large and complex literature on Congressional lawmaking. A *Google Scholar* query on the above theme in January 2020 in retrieved 101,000 scholarly references on this subject. Fortunately, the leading chronicler of the U.S. Civil Service system, Paul P. van Riper (Van Riper, 1958, 1983) defined four major government periods that simplify understanding of history and show relevant cyclical features. I summarize them below, with update of the most recent period.

---

consumption was 11%, compared with Sweden at 55%. Renewable energy as a percent of electrical power generation was 17% in the U.S. compared with 46% in Germany. Data Sources: U.S. Energy Information Administration; International Energy Agency, 2020.

[4] Leading European nations like Germany, Austria, the Scandinavian nations, and Italy did not give up their traditional industries and products.

The Federalist-Jeffersonian period from 1789 to 1829.

The U.S. founders created an effective and, in many respects, remarkably modern administrative system. The first six presidents followed the precedent of George Washington in making government appointments based on competence. The positions were expected to be permanent assuming proper performance. The Supreme Court's decision in *Marbury vs. Madison (1803)* confirmed that under the U.S. system of "laws not men" an appointment could not be reversed by the president except for deficient performance.

A 10-year study of the U.S. Government by Paul Light (Light, 2009) noted the insightfulness of administrative procedures introduced by Alexander Hamilton. Technology has changed dramatically since the Revolutionary War period, but human nature has not fundamentally changed. The insight into human behaviors displayed by framers of the Constitution was on view during the recent impeachment trial of President Trump (January 21-Feb.5, 2020) as leaders of both parties expressed their commitment to principles and procedures drawn up 240 years ago.

The period dominated by the spoils system initiated by Andrew Jackson (1829-1837).

Holding that the previous appointment approach was elitist, President Jackson introduced the patronage system, in which the executive replaced a predecessor's appointees on the basis of personal or party loyalty. This practice might seem to strengthen the executive. In practice, it had the opposite effect by preventing development of stable and effective administrative systems (Smith, 1942). During the spoils era Congress gained power. Government agencies became so disrespected that Congressional appropriations bills for the Interior Department could specify salary levels for muleskinners and laborers and budgets for hammers and nails. Land development in the West was chaotic (Bates, 1992).

The period of independent operation of federal agencies (1900-1950).

Reform movements in the later 19th Century culminated in the administration of Theodore Roosevelt, by which time the merit system incorporated in the *Pendleton Civil Service Act of 1883* covered over half of government employees. It would reach 80% by 1930 (Van Riper, 1983). Beyond the merit system for classified workers, both parties embraced the Progressive movement's principle that presidentially-appointed policymakers should be chosen on the basis of qualifications and ability to exercise independent leadership with minimum external interference. The positive aspects of ensuing developments described below tend to be obscured by recent more cynical views of American political history like that of (Wilentz, 2016). .

Increased public and Congressional trust in agency operations led Congress to abandon the micromanagement exhibited by laws during the Gilded Age (1869-1890). Shorter, simpler laws laid out missions and objectives but delegated responsibility for operational policy to agency leaders. For example, the *Forest Transfer Act of 1905*, which moved responsibility for forest management from the Department of Interior to the Department of Agriculture occupies only a half-page. The *American Antiquities Act of 1906* was four paragraphs long.

President Franklin Delano Roosevelt's policies were vigorously partisan, influenced by the crisis of the Depression and by the leftist orientation of key advisors. However, a respected

assessment of Roosevelt's New Deal policies (Leuchtenberg, 2009) indicates that in appointing agency heads Roosevelt systematically chose leaders for competence and leadership qualities over partisan loyalty. Harold Ickes, Secretary of Interior in all four Roosevelt terms, was a moderate Republican who often disagreed with Roosevelt. The minimal intrusion of Congress in agency management is reflected in the brevity of environmental and land use laws. These laws rarely exceeded 20 pages until 1970. For example, the powerful *National Environmental Policy Act of 1969* was only seven pages long.

Another characteristic of the independent era of federal agencies was that experts from agencies assisted Congress in in drafting new legislation. A parallel system is employed at the present by advanced European nations. The party or coalition in power decides on objectives for a new law. It then turns the concepts over to teams from relevant federal ministries, who complete drafting of the law. The task group shows versions to various constituencies to gauge response to the proposed law. If deemed satisfactory the completed draft is reviewed by parliamentary committees before final modifications and presentation for vote in parliament (Manheim, 2009).

The Post World War II period.

"The roof fell in on our administrative state in the 1960s and early 1970s" (Green, 1990). This may not apply to the Kennedy administration; JFK encouraged his recruiting teams to deemphasize party loyalty in seeking talent for policymaking appointments. The three top cabinet positions were held by Republicans and he retained most of President Eisenhower's science advisors (Dickson, 1988).

A major step toward reestablishing patronage systems and loss of professional balance in federal agencies is agreed by many scholars of public administration to be President Jimmy Carter's *Civil Service Reform Act of 1978* (CSRA) (Howard, 1978; Pfiffner and Brook, 2000; Rosen, 1978; Sundquist, 1980). Notably critical of the federal government bureaucracy, Carter gained increased control of agencies through the CSRA's creation of a Senior Executive Service (SES) that provided a mobile body of senior administrators. Ten percent of SES personnel could be appointed by the president as temporary administrators to work under agency heads and "Plum Book" appointees. The new powers of the president gave the incoming Reagan Administration a major lever in its initial effort to roll back enforcement of regulations (McGarity,1986)[3].

BACKGROUND TO THE FRAMING OF THE CLEAN AIR ACT AMENDMENTS

A Union Oil Company offshore oil platform in federal waters off Santa Barbara California blew out on January 28, 1969. The now largely forgotten event had profound consequences. Images of blackened sands and oiled ducks on the pristine beaches of Santa Barbara appeared on nightly TV news screens across the nation. Coming after air pollution that led to deaths in New York City and the *Clean Air Act of 1963*, oily debris burning in the Cayuhoga River (Adler, 2002), and Rachel Carson's revelations about pesticide threats to America's revered bald eagle (Carson, 1962), the spill created a sense of national environmental crisis. The fact that laxity by a federal supervisor was involved in the blowout increased

skepticism about the ability of existing federal agencies to exercise stewardship over the environment. The foregoing events and their times are detailed by Manheim (2009).

The Santa Barbara offshore oil spill galvanized activist senators concerned with environment. Interviews with Leon G. Billings, former legislative director for the Subcommittee on Air and Water Pollution of the Senate Committee on Public Works (Billings, 2005, 2008) revealed previously unreported information about the framing of the *Clean Air Act Amendments of 1970*. Under the leadership of chairman Edmund Muskie (D) of Maine, five senators on the Subcommittee spearheaded groundbreaking amendments to the *Clean Air Act of 1963*.

---

[3]In the first speech to Interior employees Secretary James Watt referred to his intention to "clean house" in the Department of Interior (Watt, 1981).

In contrast to normal legislative practice involving committee staff, the new law was crafted largely by the senators. Three of the five, Howard H. Baker of Tennessee, J. Caleb Boggs of Delaware, and John Sherman Cooper of Kentucky, were Republicans. The other Democrat besides committee chairman Muskie was Thomas Eagleton of Missouri. The five came together regularly to work on an unprecedently complex and rigorous law. Senator Baker, who had an engineering background, supplied much of the scientific and technical detail for what became the *Clean Air Act Amendments of 1970* (Billings, 2005; Manheim, 2014a). The framers participated in extensive hearings on the law. The active efforts of the bipartisan group help account for the law's unanimous approval in the Senate. In contrast with today there was then clearly no political polarization over environmental policy.

As mentioned earlier, up to 1970 administrative laws relating to environment, public health, and land use rarely exceeded 20 pages (Fig. 1). The *Clean Air Act of 1963* that the CAA 1970 amended was nine pages long. However, it already suggested a sense of urgency in controlling air pollution. Provisions authorizing payment of up to three quarters of the cost of state and local air pollution programs went as far as possible to push action without exercising control over these jurisdictions.

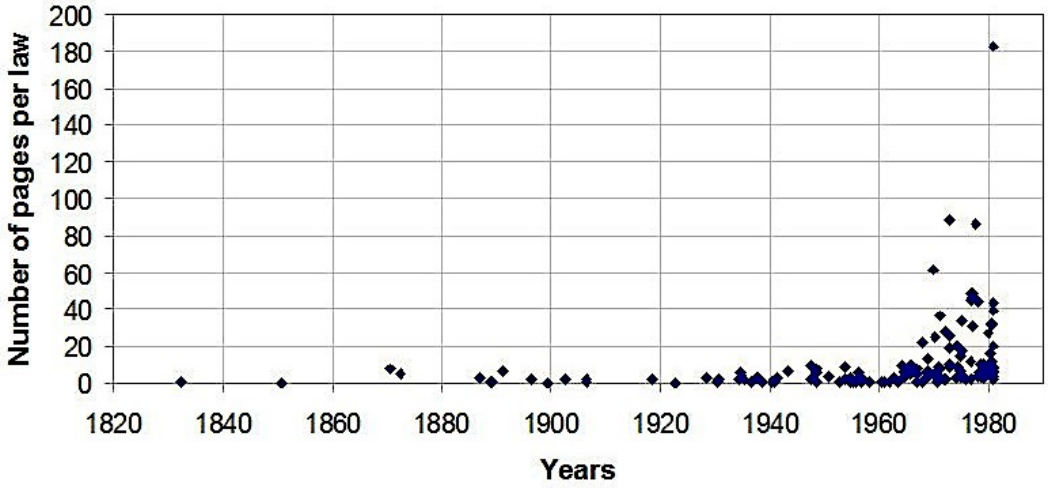


Figure 1. Page length for federal administrative environmental and land use laws from 1830 to 1980. Data from (Frank T. Manheim, 2014b).

The rigor of the 1970 CAA law was increased by political pressures from various directions. Aware of rising public concern about environment, President Nixon brought a cadre of "tree huggers" headed by Russell Train (President of the Conservation Foundation) into his White House. His speech on July 19, 1970 announcing creation of the Environmental Protection Agency proposed establishing and enforcing national air quality standards. Ralph Nader put Chairman Muskie (a potential presidential candidate) personal pressure, attacking him for being in the pocket of Maine paper companies (Nader and Esposito, 1970).

In unambiguous language, much of it understandable by nonspecialists, the new law set forth unprecedentedly detailed and rigorous operational policies. Directives dealt with types and sources of emissions, provisions for approving technical procedures, research grants, kinds and requirements of permits, application forms, types and frequency of reports, review and

coordinating panels and enforcement provisions. If states delegated to implement action failed to submit timely and adequate plans the Administrator was charged with preparing and publishing proposed regulations for those states.

The toughness of the enforcement provisions, with terms like " *noncompliance*", "*violations*", "*violator*", and "*civil action*", is displayed in Section 113 (*Federal Enforcement*). It included fines of $25,000 per day and imprisonment for up to one year that could be assessed for violation of standards. $25,000 in 1970 would be equivalent to $165,000 in 2019. Section 114, 2, (A) (*Inspections, Monitoring, and Entry)* further stated that authorized officials *"shall have a right of entry to, upon, or through any premises in which an emission source is located or in which any records required to be maintained"*.

The above provisions were not the law's only measures to assure compliance. Section 304 authorized private enforcement of public law, a novel provision unique then and now among advanced nations. It authorized any citizen to sue both individuals and also government institutions including EPA in federal court in order to enforce the law. Litigation costs could be reimbursed. Billings (2008) reported that, fearing capture of federal regulators by powerful private interests, Senator Eagleton had especially advocated for citizen litigation, an approach promoted in a book published nearly simultaneously with passage of CAA 1970 by Michigan attorney, Joseph Sax (Sax, 1971).

STRUCTURAL DESIGN OF THE 1970 CLEAN AIR ACT AMENDMENTS

The CAA 1970 statute's broad extension of federal authority and complex provisions was assigned to the Environmental Protection Agency for implementation. It called for scientific and professional staff to perform and sponsor research to determine parameters of standards and manage other regulatory provisions. However, EPA was precluded from considering cost in enforcement decisions or making policy changes without Congressional approval[5]. Through its detailed provisions and restrictions, Congress in effect transferred primary leadership for environmental management from scientific and professional agencies to itself. In effect Congress became the sheriff and the new Environmental Protection Agency became the sheriff's summons server.

Up to this time federal science agencies had limited regulatory responsibilities but freedom to exercise balanced discretion in their functions. With rare exceptions, organizations like the Department of Agriculture, Coast and Geodetic Survey, Geological Survey, Surgeon General and The Public Health Service, Fish and Wildlife Service, and Weather Bureau were respected as professional public service agencies. Their research and technical information, standards, and guidance were widely adopted by States and municipalities. The Environmental Protection agency was the first agency to be given a primarily regulatory and enforcing role[6]. Given the major impact its mandated functions had on a range of economic activities, it soon gained an image different from that of previous agencies.

[5] "*We also recognize that the relevant provisions of the Clean Air Act forbid EPA to consider costs in deciding on the stringency of national ambient air quality standards, both primary and secondary*". Letter from OIRA Director, Cass Sunstein, to EPA Administrator, Lisa Jackson (Sunstein, 2011).

[6] The Corps of Engineers had responsibility for regulating navigation and other aspects of the nation's waterways through the Rivers and Harbors Act of 1899, but its early efforts to control waste discharge were met with lawsuits and opposition from municipalities, causing it to largely leave controls to states and cities USACE, 2007.

Basic structural features of the CAA model, adopted in whole or part by later laws in the 1970s are enumerated below (modified from Manheim 2009).

- *Preemptive detail*. Laws prior to 1970 gave discretion to regulatory agencies to formulate and modify operational policies to solve problems, take advantage of new information, and plan for the future. Federal agencies also guided Congress in preparing legislation. The CAA reversed the relationship. Modification of mandated policies required Congressional approval (i.e. amendments or new laws).
- *Specificity.* Unlike the NEPA Act that emphasized many-sided evaluation of environmental issues, the CAA focused on a specific environmental problem – in this case air pollution. Specificity lent itself to concrete definitions and standard operational procedures. This approach was later applied to water pollution, toxic waste disposal, and other environmental issues.
- *Uniform standards*. EPA was to establish regulations and rules including standards for maximum permissible pollutant levels (e.g., stack emissions). These would be uniform and apply nationally or as specified.
- *Forcing technology:* "Technology-forcing standards" meant setting standards beyond existing capabilities and requiring all producers of pollutants to move toward compliance within given time frames.
- *Priority for environmental protec*tion. Enforcement of environmental standards took precedence over all other values except where explicit and limited options to seek waivers were provided.
- *Monitoring and publication of results.* Emitters of pollution were required to monitor emissions and report the results (independent checking might be employed). The enforcing agency in turn would disseminate data to the public in accessible form.
- *Delegation of implementation to states.* States were given authority to implement application of the laws and oversee monitoring. But if they did not agree or if their plan for compliance was found unacceptable, the federal government could take over and enforce the laws.
- *Rigorous enforcement and punitive measures for violations.* Penalties were defined for failure to meet standards and other violations. Violators could be taken to court either by agency legal staff or through attorneys for the Justice Department. Disputes were referred to federal courts.
- *Citizen enforcement*. Citizens and citizen groups (e.g. environmental NGOs like the Sierra Club, Friends of the Earth, National Resources Defense Council, as well as local groups) were empowered to sue operators and also to sue regulatory agencies including EPA in federal court. Citizen action was encouraged by provisions allowing reimbursement of reasonable legal and witness fees in successful suits. In some cases even reimbursement for unsuccessful suits could be authorized (Kramer, 1982).

The laws' provisions effectively combined to allow ordinary citizens and their attorneys to monitor environmental performance. Extensive professional training would not be needed to identify violations and bring suit[7]. Priority for environmental protection meant that operator

[7] Karen Schapiro, a graduate of Northwestern Law School's Environmental Law program, along with local citizens, was temporarily successful in blocking the Milwaukee Metropolitan Sewerage District from discharging sewage effluent into Lake Michigan. Schapiro was lauded as a crusader by newspaper articles in the *Chicago Sun Times* (Wisby, 2005). Wisconsin's Attorney General and a 46-page research report by the Wisconsin Natural Resources Board brought out

objections involving economics could not be used as a defense against failure to meet standards. The intent of the framers regarding the primacy of environment was reaffirmed in the Supreme Court decision in *Whitman vs. American Trucking Associations*, Inc. (2001). In the opinion written by Justice Antonin Scalia the court found that EPA could not consider cost in implementing national ambient air quality standards.

Subsequent environmental laws adopted similar command and control approaches. Henceforth, where Congress perceived major societal problems, it tended to assume direct responsibility for providing fixes. This is demonstrated by continued growth in the length and complexity of environmental laws shown in Fig. 1, and later environmental and other laws. In preparation for the book in 2009 Manheim, 2009 the author found no fewer than 500 energy bills proposed to the 2010th Congress, with a major bill sponsored by Senators John Kerry and Joseph Lieberman taking up nearly 1000 pages. *The Affordable Care Act,* passed in 2010, filled 2700 pages.

RESULTS OF THE CAA 1970 AND ENSUING 1970s LEGISLATION

Effects of the CAA's technology forcing provisions

A book detailing the implementation of the CAA and associated judicial problems Melnick, 1983 emphasized the problems created by the new legislation's groundbreaking "technology forcing" mandates[8]. The unprecedented new strategy laid out requirements for air quality standards with time frames (1975) that were unachievable with existing technology. This was intended to force companies to accelerate technological development. If this proved unfeasible EPA was authorized to extend time frames but only to specified limits. These provisions created major uncertainties for EPA as well as affected industries.

EPA's zealous young lawyers did not hesitate to shut down operations that failed to comply with standards but EPA's senior managers and Administrator William D. Ruckelshaus understood that closing down businesses would arouse hardship, local antagonism, and political opposition. The crudity of the legislation forced EPA into a series of compromises and delaying tactics when a majority of areas failed to attain standards (Melnick 1983).

Role of the courts

Melnick (1983) emphasized that federal courts played a significant role in events. Judges had the duty to protect public health and environmental values. They also saw that EPA administrators "had the power to destroy firms and put thousands of people out of work". Federal courts lacked scientific and professional expertise to deal with complex technical issues. They therefore tended to uphold agency decisions that had been developed by scientific and technical

---

factors not considered in the Schapiro suit. Research by Manheim (2009, p. 210) noted that the MMSD had been given a Platinum Award for 9 years of 100% compliance with EPA NPDES discharge permits (NACWA, 2006).

[8] Asserting that "Congress and the Executive made bold promises to the public -- the war on this, the war on that -- but nothing was ever accomplished in a timely way", Senator Howard Baker wrote that *". . . we [he and Senator Thomas Eagleton] believed that the body politic had elected us to make the difficult decisions. We did not believe that we were elected to delegate our responsibilities to administrative agencies"* (Baker, 2005).

specialists. Some courts even took activist positions that increased the severity of the CAA law. Examples are *Sierra Club v. Ruckelshaus* (1972) that ruled state implementation plans must not only attain national air quality standards, but also avoid degradation of air cleaner than national standards. The noted case, *National Resources Defense Council v. Environmental Protection Agency*[9], disallowed dispersion with tall stacks as a means of reducing ambient pollution levels. The Supreme Court decision in *Whitman v. American Trucking Ass'ns, Inc.* **(**2001) confirmed that EPA could not consider the cost of implementing a national ambient air quality standard in its enforcement decisions.

Major outcomes

The positive results of the Clean Air Act Amendments, led by 90% reduction in lead pollution, are too widely referenced in books, scholarly texts, and websites to need review here. Its achievements have been highlighted in benefit/cost analyses conducted by EPA[7]. However, while economic declines are documented in books and other publications in the 1970s and 80s, they are often passed over in recent historical reviews of economics and productivity, such as that by (Shackleton, 2013).

Unanticipated economic declines in the 1970s were analyzed in detail by economic pioneers in measurement of gross national product and economic productivity (Denison, 1979; Kendrick and Grossman, 1980). Ira C. Magaziner and Robert B. Reich (the latter was professor of management and policy at Harvard's Kennedy School and later labor secretary in the Carter Administration) observed that median family income increased more than 30% in the previous two decades but declined 6.7% in the 1970s (Magaziner and Reich, 1982). From 50% domestic production in the 1960s, electronics fell to 8%. A long list of manufactured goods was now made abroad. Except for naval vessels, shipbuilding was virtually extinct (Ullmann, 1988) Ullman's book, *An Anatomy of Industrial Decline*, lists developments and public concerns. The 1970s were characterized by stagflation, which included a rise in inflation from 3.4% in 1973 to 10-12% in 1975 (Amado, 2019).

A limited view of the 1970s developments was incorporated in *The Deindustrialization of America* (Bluestone and Harrison, 1982). The authors and their citation of case studies of devastated communities like Youngstown Ohio, Oakland CA, and Montana copper mining centers (Cowie and Heathcott, 2001) list a variety of circumstances for deindustrialization, emphasizing shortsighted or greedy industry managers. The new laws and regulatory policy are mentioned only in passing, citing complaints by companies. Omission of the 1970s laws from meaningful consideration is highlighted by the fact that the latter book's index does not include regulations.

A further consequence of the CAA and subsequent laws was the dramatic increase in suits filed in federal court, illustrated in Fig. 2. This increase in litigation is accounted for by the fact that the CAA of 1970 assigned to federal courts responsibility for adjudicating disputes as well as applying punitive measures. Unlike environmental courts in Canada, Sweden, and other nations

[9] *Natural Resources Defense Council, Inc. v. EPA*, 489 F.2d 390, 394-396 (5th Cir. 1974)

[7] While costs were computed from direct outlays, benefits were early estimated through complex unpublished formulas ultimately based on the assumed value of avoided deaths, suggested to be between $3 and 5 million per person. Unrealistic results associated with such benefit calculations are illustrated by a retrospective analysis for the CAA in 1997 (cited in Manheim 2009 but no longer available). The EPA estimated that from 1970 to 1990 costs were $553 billion. Benefits varied between $7 and $50 trillion with an average estimated at 22 $ trillion.

(Pring and Pring, 2016) U.S. federal courts lack specialized professional expertise and problem-solving functions. As a result, they mainly declare winners and losers rather than assisting in finding productive solutions to conflict.

The Civil Rights Act of 1964 (24 pages) had been the first law to allow suit against government. Intensified by the environmental laws, litigiousness expanded to other areas of society (Kagan, 2003). A study of civil litigation reported that " . . *when Congress distrusted presidential commitment to robust implementation of legislative mandates from the late 1960s to the mid-1990s . . the population- adjusted rate of private statutory suits in federal court exploded by a factor of ten"* (Farhang, 2018).

The new lawmaking paradigms were reinforced when the framers of the CAA introduced the *Federal Water Pollution Control Act Amendments* of 1972, commonly referred to as the *Clean Water Act Amendments* (CWA). The CWA had a similar structure to that described for the CAA. The citizen suit provision of the CAA was incorporated in the CWA and at least seven other environmental laws, among which are the *Endangered Species Act of 1973* and the *Safe Drinking Water Act of 1974*.

The influence of the CAA on subsequent legislation was heightened by the fact that subcommittee chairman, Edmund Muskie, was respected for leadership in earlier air pollution legislation, as well as his political stature as the Democratic vice presidential candidate in the election of 1968. He was a candidate for the Democratic nomination for president in the 1974 election. Other framers of the legislation also enjoyed respect. Thomas Eagleton would become the running mate for Senator George McGovern in the 1974 presidential election, and Howard Baker became Republican majority leader in the Senate.

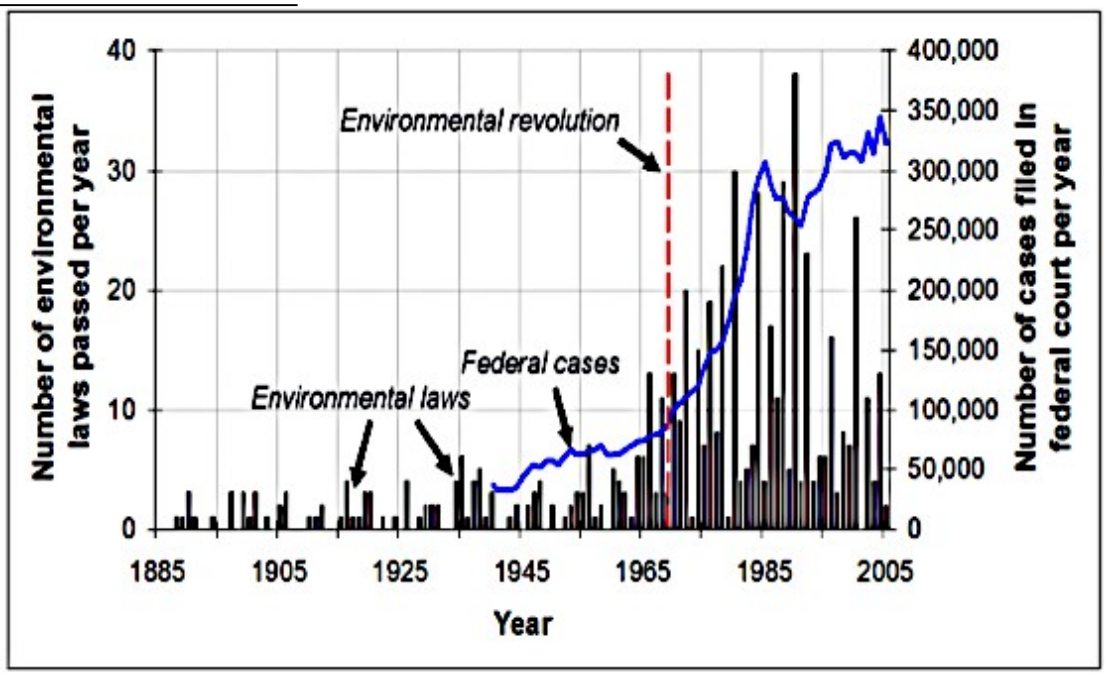


Fig. 5. Plot of environmental laws passed and suits filed in federal court per year. Plot from database reported in Manheim and Fuhs (2007) and Manheim (2014b).

A further development linked to the direct and indirect effect of the CAA and subsequent environmental laws was delays and cost overruns in infrastructure projects. The Pentagon, the world's largest office building, was built in 17 months from 1941 to 1943 (Vogel, 2007). In contrast, Boston's Big Dig, planned in 1982-83, did not get full operating permits until 1991 (Gelinas, 2007). Approved by federal regulators for $2.56 billion, "the serpentine scandal engaged in by [state and federal] government officials and a world-famous firm with political clout" resulted in final costs estimated to be 500% higher (Pike, 2006). Though not as extreme as the Big Dig, delays and cost overruns for infrastructure development became a pervasive reality in the United States in the 1970s. A detailed but overly cynical summary of federal projects (Edwards and Kaeding, 2015) tends to generalize delay and cost overruns as endemic to governmental projects. It fails to recognize earlier efficient operations in the U.S. For example, from 1904 to 1944 New York subway fares remained a nickel, during which time the subway network was expanded (Gavrielov, 2019).

Causes of economic decline

In his extensive analysis of economic decline in the 1970s Denison (1979) lists 17 potential causative factors but emphasizes environmental controls. Besides environmental controls Ullmann(1988) cited military preemption of industrial effort and scientific and technical talent, excessive taxes on capital gains, and poor policies on the part of business. The growth of regulatory restrictions has been catalogued in the comprehensive *RegData* database (McLaughlin and Sherouse, 2015). Unlike the European public, the readiness of the American public to buy products regardless of their origin appears to be an underrated factor in outsourcing manufacturing abroad.

In recent decades the decline in U.S. manufacturing has been explained by automation and inevitable evolution in advanced nations, e.g. ". . . *deindustrialization is primarily a feature of successful economic development . . . North-South trade has very little to do with it*. (Rowthorn and Ramaswamy, 1997). However, such arguments do not explain the disproportionate deindustrialization experienced by the former U.S. industrial powerhouse in comparison with advanced European nations. Magaziner and Reich (1982) provide a table showing that by 1979 gross domestic product per capita in the U.S. had fallen behind nine European nations.

Besides regulatory disincentives emphasized in the book, *Going by the Book: The Problem of Regulatory Unreasonableness* (Bardach and Kagan, 1982), the time plots in Figs 3-5 show various economic parameters that point to a narrow time frame in the early 1970s for the onset of change.

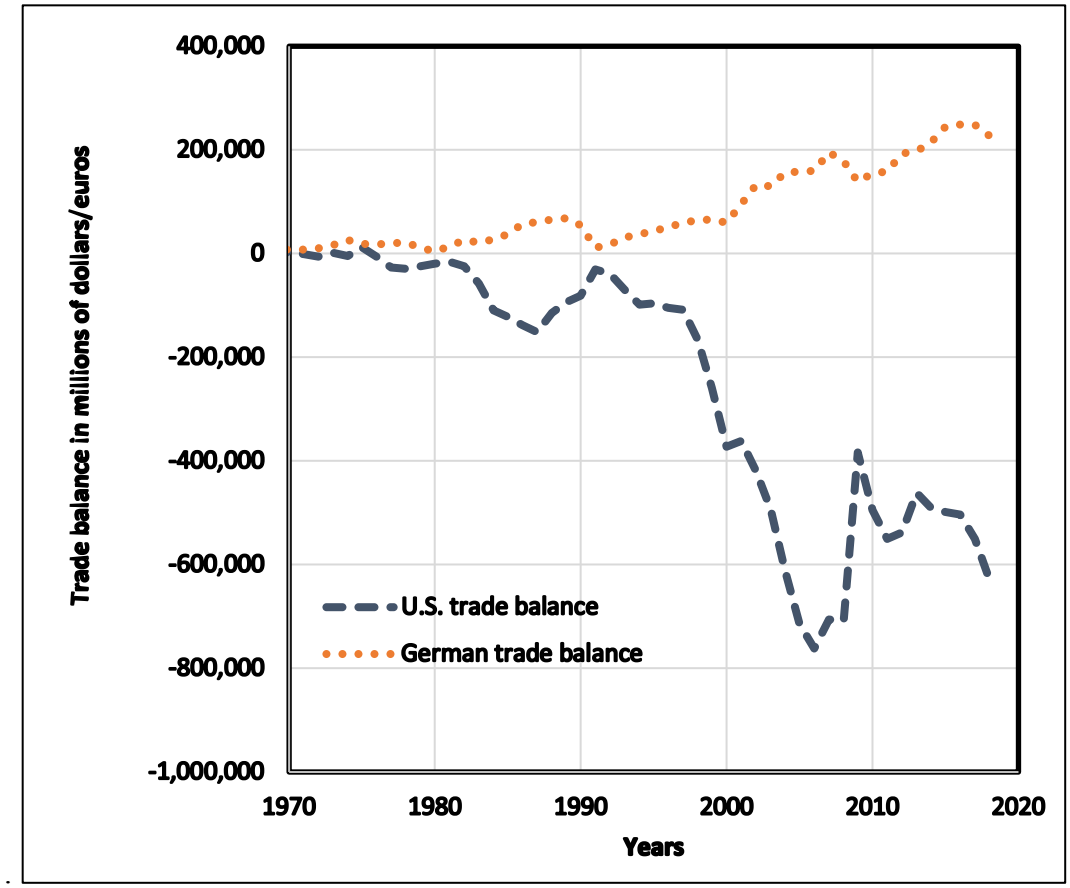


Figure 3. U.S. and German trade balance: 1960-2018. U.S. data source: (Census, 2019); German source: (Statistisches Bundesamt, Deutschland, 2019). The dip in German trade balance in 1991 is attributable to impact of reunion of East and West Germany in 1990.

Before 1970 The U.S. maintained trade surpluses for 100 years. Fig. 3 shows that in comparison with Germany[6], the U.S incurred deepening foreign trade deficits after 1970. There are claims that concerns about foreign exchange deficits or outsourcing are based on myths (Mankiw and Swagel, 2006). However, whereas loss of the U.S.'s broadly based manufacturing industries resulted in increased imports, Germany retained and expanded manufacturing, resulting in foreign trade surpluses. In short, while other factors may be involved, foreign exchange surpluses imply the existence of dynamic industries that are able to maintain associated jobs and economic development in the face of foreign competition.

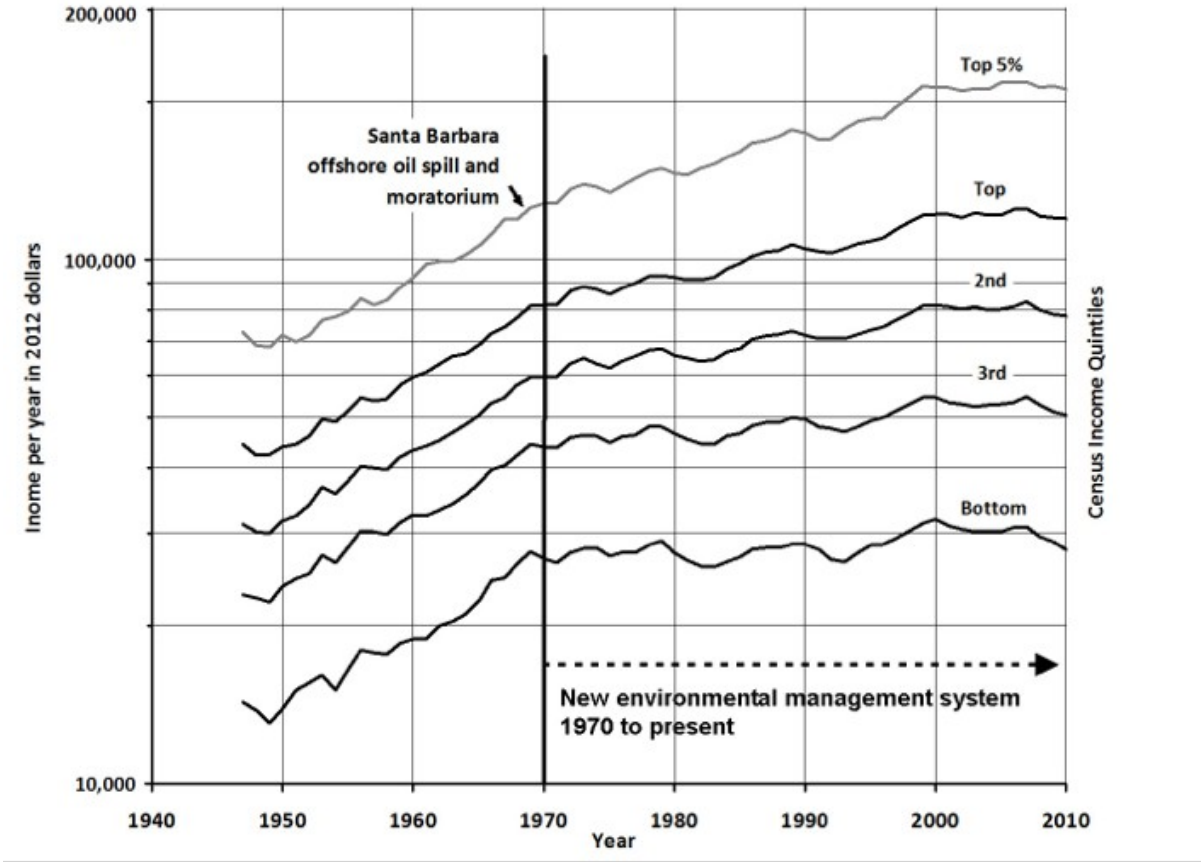


Figure 4. U.S. Income quintiles from 1948 to 2010 (U.S. Census Bureau data).

The historical plot of income quintiles in the U.S. from the end of World War II to 2010 (Fig. 4) shows incomes on a log scale. This records relative changes at the different income levels proportionally. Note the marked change in slope for all income levels around 1970. Prior to 1970 the lowest quintile grew more rapidly than higher quintiles. After 1970 the trend is reversed, with little change in inflation-adjusted income for the bottom quintile over the entire period.

A comparison between productivity and hourly compensation is provided in Fig. 5. Like the two preceding plots the significant change occurs at or close to 1970. Claimed causes like automation or business practices referred to earlier are unlikely to produce changes with the sharp, common time of onset shown in the figures. The immediate impact brought about by the Clean Air Act Amendments of 1970 is regarded as most obvious and documentable explanation of the declines in the 1970s.

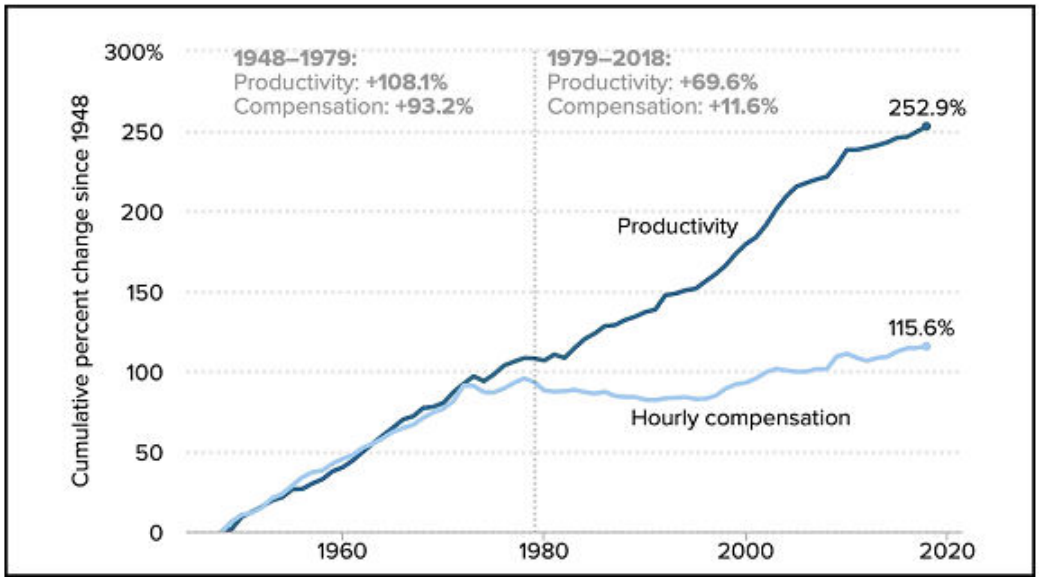


Figure 5. Time plot of productivity and hourly compensation 1948-2018. Figure from the Economic Policy Institute (EPI, 2019), computed from data by the Bureau of Labor Statistics and Bureau of Economic Data. Productivity refers to growth of output of goods and services less depreciation, per hour worked.

Areas of society most affected by federal regulations and subsidies are headed by manufacturing and health care (Miller, 2013) based on RegData (Al-Ubaydli and McLaughlin, 2014). The earlier study by Manheim (2009) found mining, followed by primary metals to be the most adversely affected.

REFORM MOVEMENTS

Recognition of problems caused by excessive regulations grew in the late 1970s. The respected legal scholar, Thomas O. McGarity, observed that:

> "*Many regulatory reformers believe that the public still desires a relatively radical shift in the substantive goals for regulation and a gradual dismantling of many of the institutional structures that are the legacy of earlier reform movements. If the job is approached in a more politically astute fashion, the new "regulatory relief" team of the second Reagan Administration can accomplish lasting changes"* (McGarity, 1986).

In addition to bills submitted by industry-friendly legislators, reform legislation was included in the Heritage Foundation's *Mandate for Leadership*, a massive document prepared for the incoming Reagan Administration (Heatherly, 1980). A number of administrative procedures initiated by the Office of Regulatory Reform under leadership of Vice President G.H.W. Bush stuck (McGarity, 1991). However, legislative efforts including preparation of a new Clean Air Act were derailed by Congressional backlash against the administration's campaign to roll back regulatory enforcement. This campaign was led by firebrand appointees, James Watt (Secretary of Interior), and Ann Gorsuch[10] (EPA administrator), both of whom were forced to resign by 1983

[10] Gorsuch's actions included a 28% reduction in EPA's budget (Lash et al 1984). EPA's functions were essentially restored by William Ruckelshaus, the first EPA administrator, who was brought in to replace Gorsuch.

(Lash et al., 1984).

However, controversy over environmental policy had widened to political polarization (Manheim 2009) . Democrats became the party of the environment and Republicans became the party of industry. Neither the *Reinventing Government* initiative of the Clinton administration nor House of Representatives' Speaker Newt Gingrich's *Contract with America* made significant changes in the regulatory labyrinth[11] (Manheim 2009). Except for an innovative cap and trade measure for sulfur removal in the *Clean Air Act Amendments of 1990*[12] there have been no significant reforms. From the early 1980s through the 1990s policy researchers and think tanks like Resources for the Future, The Brookings Institution, and the American Enterprise Institute, sought reform of the regulatory system (Bardach and Kagan, 1982; Hahn and Litan, 1998; Tietenberg, 1999) but these institutions largely gave up after 2000 (Kash, 2005; Mann and Ornstein, 2010).

The closest approach to environmental regulatory reform was led by California Representative Richard Pombo, Chairman of the House Resources Committee. His committee initiated efforts to reauthorize and reform the *National Environmental Policy* and the *Endangered Species Acts*. Nominally bipartisan bills passed the House of Representatives in 2005 but failed in the Senate.

Before he was appointed to the Supreme Court, Justice Stephen Breyer published a book on risk regulation (Breyer, 1993). He observed disproportionate cost and inefficiencies in the current regulatory system. A leading book on environmental regulatory reform was authored by Daniel Fiorino, who served as an administrator in the U.S Environmental Protection Agency (Fiorino, 2006)[13]. Fiorino pointed out that U.S. regulatory policies required compliance but had no provisions to promote performance.

The most comprehensive reform effort to date was launched in 2007 by professor of environmental law at New York University, David Schoenbrod, and cooperators. Schoenbrod, a former staff attorney for the National Resources Defense Council in the 1970s, led suit suit against EPA to include lead in air quality standards. However, in the 1990s Schoenbrod turned reform advocate (Schoenbrod, 1993; Sandler and Schoenbrod, 2003; Schoenbrod et al, 2010. The 2007 reform symposium included participation by many of the nation's leading environmental law and policy experts. The book summarizing its conclusions (Schoenbrod et al, 2012) was praised by two former EPA administrators; see also a detailed review by Esty, (2017).

A major research program cataloging federal government regulations and regulatory restrictions was initiated by the Mercatus Center of George Mason University (Al-Ubaydli and McLaughlin, 2014; McLaughlin and Sherouse, 2015), and an annual tally of total regulations in the federal register has been published by Wayne Crews (Crews, 2018).

Given the legislative paralysis in Congress, President Obama indicated readiness to use his pen and telephone (Obama, 2016), i.e., he would issue Executive Orders and mobilize public opinion to promote energy policies against climate change. However, the Trump administration has "revoked or rolled back" more than 60 environmental rules and regulations (Popovich et al., 2020). This suggests that without addressing regulatory reform and polarization, U.S. environmental policy will remain conflicted. Efforts against global climate change will face frustrating barriers.

---

[11] Examination of submitted bills found that few got out of committee Manheim, 2009.

[12]Passage of the 1990 bill was aided by Senate leaders, George Mitchell (D), Robert Dole (R), and by Fred Krupp, President of the Environmental Defense, who advocated for the cap & trade feature.

[13] Fiorino's book, *The New Regulation*, won the Brownlow Award of the National Academy of Public Administration (NAPA) for "excellence in public administration literature" in 2007, However, Fiorino's Performance Track program at the EPA was discontinued by EPA administrator Lisa Jackson in May, 2009.

DISCUSSION

Why were the framers not more sensitive to potential economic consequences of the CAA's provisions?

The framers were not known for radical philosophies. The Senate hearings included genuinely radical proposals such as banning automobiles with gasoline engines, but the framers showed no such inclinations or history. Muskie, who had led in enactment of the *Clean Air Act of 1963,* kept air pollution controls in the hands of state and local authorities. Caleb Boggs had helped write *The Water Quality Act of 1965* which also maintained local controls. Nixon environmental advisor and later Undersecretary of Interior, John C. Whitaker, was quoted as saying *"There's only one word, hysteria, to describe the Washington mood on the environment issue in the fall of 1969."* (Rinde, 2017).

Beyond environmental crisis, the framers' thinking was influenced by the U.S.'s overwhelming world economic and technical dominance in the recent past. Its productivity reached a peak in the middle 60's and the U.S. had just landed a man on the moon in 1969. A rare window into the thinking of the framers was provided by Senator Howard Baker years later (Baker, 2011)[14]. It suggests that the framers of the CAA may have assumed inexhaustible resilience on the part of private industry. This background helps explain why their actions were minimally tempered by concern over potential effects on the economy.

Why would Congress overwhelmingly embrace the drastic new regulatory policy?

Again, the sense of crisis was a key factor. Selling points for the bill were the status and bipartisan makeup of the framers and the knowledgeability and expertise shown in the writing of the law. Most Congressmen had little scientific or professional expertise, which likely led them to rely on the framers' competence and judgment. Industrial leaders and state officials at hearings expressed strong concerns about the law and there was initial opposition in the House of Representatives (Hildenbrand, 1985), but a milder version had been approved by a vote of 374:1 by the House of Representatives on June 10, 1970 and a toughened version was approved 72 to 0 by the Senate on Sept. 22 (Kenworthy, 1970).

Legal and constitutional doctrine

In recent years contention over environmental and energy policy has increased dramatically. Environmentalists' urgent calls for more stringent policies to control greenhouse

---

[14] A question put to Senator Howard Baker by the author in 2011 offers a rare window into the thinking of the framers years later (Baker, 2011).

> *"Q. The CAA and CWA laws laid down rigorous procedures and penalties . . . . I gather that it was assumed that larger corporations could accommodate the stringent new conditions without major economic dislocation. Did Senator Baker or other Subcommittee members have concerns about potential inhibition of manufacturing startups?"*
>
> *"A. I'm not sure I gave much thought to the application of penalties, but I am sure we didn't consciously discriminate between large groups and smaller groups. However, it may have ended up that way."*

gases because of global climate change are countered by conservatives' concerns about expanded federal controls over American society. They cite controls exercised through labyrinthine laws like the *Dodds Frank Banking Act of 2010* (2300 pages) and the *Affordable Care Act of 2010* (2700 pages), as well as shorter older laws like the *Natural Gas Act, Coastal Zone Management Act, Rivers and Harbors Act, and Wild and Scenic Rivers Act*. One of the shortest laws, the *National Environmental Policy Act of 1969* (NEPA) has among the most powerful impacts. It gained this power through court interpretations partly at variance from the intent of its framers (Caldwell, 1992)[15]. It mandated environmentally conscious planning of federal or federally linked activities, but unintentionally helped foster "Not In My Back Yard" (NIMBY) attitudes that have stopped or delayed renewable energy initiatives[16].

Congressional nondelegation doctrine (Stewart, 1975; Whittington and Iulano, 2017) has become involved in a current split in the Supreme Court. Conservative justices hold that very broad delegation of societal control amounts to a dereliction of Congress's responsibilities, while defenders of delegation argue that Congress does not surrender its legislative power by delegating: It exercises that power (Mortenson and Bagby, 2020).

The framers of the CAA used Congressional authority to expand jurisdiction of EPA beyond federal or interstate activities to the whole nation. Responding to urgent concerns of the times, they prescribed rigorous procedural detail and stipulated priority of environmental protection over private property and the economy in enforcing standards. The latter measure was recognized as posing risks for conflict in society and explicitly avoided in European environmental policy (Brundtland, 1987). Predictably, antagonism over energy and environmental regulation ensued in the U.S. in the 1970s. Subsequent political polarization widened to the point that after 1990 Congressional gridlock no longer allowed update or modification of environmental laws. With Congress unable to influence environmental policy, Democratic and Republican administrations have interpreted administrative policy in conflicting ways. Neither environmentalists nor industry have been able to more than temporarily achieve policy goals.

The above problem expanded beyond environmental policy when the principle of detailed federal intervention in societal affairs became open-ended Congressional policy. The principle was furthered by federal subsidies as well as regulations. As in the case of the National Capital subway and rapid transit systems, federal subsidies inevitably politicized local engineering and policy decisions (GAO, 2005; Hollandsworth, 2015), leading to delays, cost overruns and other problems.

Serendipitous factors made the CAA more extreme than might have happened without aggravating circumstances. Fewer problems may have arisen had recognition of the need for reforms in the laws in the later 1970s been acted on. The initial law is interpreted here as a product of overreaction aided by expansion of presidents' authority to appoint federal executive agency administrators through the *Civil Rights Reform Act of 1978*.

Given EPA's unprecedented power to exercise control over virtually every industrial establishment as well as the nation's transportation network without consultation or input from Congress in recent decades, the history of CAA and subsequent laws of the 1970s can be

---

[15] The main architect of the NEPA Act was Lynton Keith Caldwell, a leading expert on environmental policy and advisor to the prime sponsor of the bill, Senator Henry "Scoop" Jackson. In his book on NEPA Caldwell wrote:

> *"Though mainstream environmental nongovernmental organizations tacitly supported Senator Jackson's bill they subsequently showed interest in NEPA primarily as the environmental impact requirement that enabled them to stop or delay specific government programs or projects to which they objected."* (Caldwell, 1998 *p.* 35).

[16] 5000 wind turbines operate in European offshore waters but only a single wind turbine field has been activated in the Atlantic coastal waters, the nation's most energetic wind corridor".

considered to incorporate examples of both delegation (CAA) and nondelegation (inability of Congress to affect environmental policy after 1990). Constitutional arguments are suggested to have come into play because Congressional gridlock and polarization (Noel, 2014) shut down other avenues for addressing disputes.

SUMMARY AND CONCLUSIONS

From 1900 until the 1970s the U.S. was generally at the frontier of new technologies and scientific developments relevant to the larger public. Environmental and land use laws were short because agency leaders developed operating policy and planned for the future. Scientific and professional agencies provided guidance and generally operated in harmony with urban authorities and the private sector. Federal agencies' regulatory functions were mainly limited to interstate commerce and federal activities. Construction and operation of urban infrastructure was efficient.

After World War II the economic and agricultural boom and growth in auto and truck transportation led to environmental stresses. A national environmental crisis was triggered by the Santa Barbara offshore oil spill in January, 1969. This catalyzed a series of groundbreaking environmental laws whose precedent was set by the *Clean Air Act Amendments of 1970* (CAA). The rigorous new law was spearheaded by a bipartisan group of five senators on the Subcommittee for Air and Water Pollution, chaired by Edmund Muskie, Democrat of Maine and candidate for vice president in the election of 1968. The law was approved unanimously in the Senate en route to overwhelming vote by Congress and signature by President Nixon.

The CAA of 1970 broke previous conventions for Congressional lawmaking. It expanded federal authority over all national (including state and local) activities related to air pollution, including automobile transportation. It incorporated unprecedented operational detail and stipulated priority of environmental protection over personal property and economic factors. Enforcement was assigned to the new Environmental Protection Agency, with disputes to be handled by the federal courts.

The CAA and later 1970s laws achieved rapid progress against environmental pollution. They gained enthusiastic approval by environmentally concerned citizens and organizations. Adversarial provisions of the laws focused on manufacturing and industry because these sectors were primary sources of pollution and were feared for their potential influence on environmental regulators. The drastic changes introduced by the laws helped bring about unexpected economic declines and disproportionate deindustrialization of the United States. Trust in interactions between government and the private sector was replaced by regulations and punitive provisions, arousing antagonism in the business community.

Overzealous efforts to roll back regulations in the first Reagan administration brought Congressional backlash. Conflict over environmental regulatory policy widened to political polarization. Democrats became the party of environment and Republicans became the party of industry. After the Clean Air Act Amendments of 1990, environmental management systems designed for earlier times and conditions largely remained frozen in place.

Because of Congressional gridlock, after 2000 successive administrations increasingly chose executive action to promote their policies, weakening respect for law and trust in the federal government. Congressional nondelegation doctrine is among legal directions embraced in the absence of other means of resolving disputes.

Given that the pathbreaking CAA (1970) and the *Clean Water Act Amendments* (1972) were passed by overwhelming bipartisan votes in Congress, it is clear that partisan polarization over environmental policy was absent in the early 1970s. Something important must have

happened to bring about current discord. This paper argues that laws passed during the 1970s fueled conflict powerful enough to ultimately shut down critical functions of Congress. With better understanding of the role of the above laws, perhaps stimulated by predictable disappointing results in rebuilding infrastructure and combating global climate change, current protagonists may realize the necessity of overhauling 1970s legislation.

REFERENCES

Adler, J. H. (2002). Fables of the Cuyahoga. *Fordham Environmental Law Journal: Reconstructing a History of Environmental Protection, XIV*, 89- (55 pages in pdf). Retrieved from http://www.law.case.edu/faculty/adler_jonathan/publications/fables_of_the_cuyahoga.pdf

Al-Ubaydli, O., and McLaughlin, P. A. (2014). RegData: A Numerical Database on Industry-Specific Regulations for All US Industries and Federal Regulations, 1997–2012. *Wiley Online Library: Regulation and Governance, 11*(1).

Amado, K. (2019, Aug. 6). Stagflation and Its Causes: Why Stagflation (Probably) Won't Reoccur. *The Balance*. Retrieved from https://www.thebalance.com/what-is-stagflation-3305964.

Baker, H. J. (2005, March 9, 2005). Cleaning America's Air: Progress and Challenges. *The Edmund S. Muskie Foundation.* Retrieved from http://www.muskiefoundation.org/baker.030905.html .

Baker, H. H. (2011, March 2). [Personal communication through Leon E. Billings].

Baldwin, N. (1995). *Edison: Inventing the Century*. New York: Hyperion.

Bardach, E., and Kagan, R. A. (Eds.). (1982). *Social regulation: Strategies for reform*. San Francisco, CA: Institute for Contemporary Studies.

Bates, S. F. (1992). The Western Public Lands: An Introduction Boulder CO: Colorado Scholarly Commons: University of Colorado Law School

Billings, L. G. (2005, April 13, 2005). Edmund S. Muskie's Legacy: Lessons for Today Retrieved from http://www.muskiefoundation.org/billings.forum.041305.html.

Billings, L. G. (2008, June, 2008). [Telephone Interview].

Bluestone, B., and Harrison, B. (1982). *The deindustrialization of America : plant closings, community abandonment, and the dismantling of basic industry*. New York: Basic Books.

Brundtland, G. H. (Ed.) (1987). *Our Common Future*: Oxford University Press, USA.

Caldwell, L. K. (1992). *Between Two Worlds: Science, the Environmental Movement and Policy Choice*: Cambridge University Press.

Caldwell, L. K. (1998). *The National Environmental Policy Act : An Agenda for the Future*. Bloomington IN: Indiana University Press.

Carson, R. (1962). *Silent Spring*. NY: Houghton Mifflin.

Census. (2019). Historical Series: U.S. International Trade In Goods and Services. Retrieved from https://www.census.gov/foreign-trade/statistics/historical/index.html, et al. (2017).

Chetty, Raj, David Grusky, Maximilan Hell, Nathaniel Hendren, and Robert Manduca. The fading American dream: Trends in absolute income mobility since 1940. *Science,* 365, 398-406.

Cowie, J., and Heathcott, J. (2001). *Beyond the Ruins: The Meanings of Deindustrialization.* Cornell University Press.

Crews, W. (2018, April 19). Ten Thousand Commandments 2018: An Annual Snapshot of the Federal Regulatory State. Competitive Enterprise Institute. Retrieved from https://cei.org/10kc2018.

Davenport, C., and Rubin, A. J. (2017, Mar. 28). Trump Signs Executive Order Unwinding Obama Climate Policies. *New York Times*. Retrieved from https://www.nytimes.com/2017/03/28/climate/trump-executive-order-climate-change.html.

Denison, E. F. (1979). *Accounting for Slower Economic Growth: The United States in the 1970's*: Brookings Institution Press. Dickson, D. (1988). *The New Politics of Science*. Chicago IL: The University of Chicago Press.

Edwards, C., and Kaeding, N. (2015, Sept.1). Federal Government Cost Overruns. *Downsizing.org*. Retrieved from https://www.downsizinggovernment.org/government-cost-overruns.

EPI. (2019, July 19). The Productivity-Pay Gap. *The Ecnomic Policy Institute*. Retrieved from https://www.epi.org/productivity-pay-gap/.

Esty, D.C. (2017). Red lights to green lights: from 20th Century environmental regulation to 21st century sustainability. Yale Law School Legal Scholarship Repository (79 p.), retrieved from https://digitalcommons.law.yale.edu/cgi/viewcontent.cgi?article=6186&context=fss_papers.

Farhang, S. (2018). Legislating for Litigation: Delegation, Public Policy, and Democracy. *California Law Review*. Retrieved from https://berkeleylawir.tind.io/record/1128586?ln=en.

Fiorino, D. J. (2006). *The new environmental regulation*: MIT Press.

Garrard, G. (Ed.) (2019). Climate Change Scepticism: A Transnational Ecocritical Analysis: Bloomsbury Academic.

Gelinas, N. (2007, Autumn). Lessons of Boston's Big Dig. *City Journal* Retrieved from http://www.city-journal.org/html/17_4_big_dig.html.

GAO. (2005). *Mass Transit: Information on the Federal Role in Funding the Washington Metropolitan Area Transit Authority* (GAO-05-358T). Washington D.C. Retrieved from https://www.govinfo.gov/content/pkg/GAOreports-GAO-05-358T/html/.

Gavrielov, N. (2019, April 12). The Subway Fare Rises on April 21. It Could be worse: One Year it doubled *New York Times*.

Green, R. T. (1990). Alexander Hamilton and the Study of Public Administration. *Public Administration Quarterly, 13*(4 (WINTER, 1990)), 494-519.

Hahn, R. W., and Litan, R. E. (1998, November 1). The AEI-Brookings Joint Center for Regulatory Studies. Retrieved from https://www.aei.org/articles/the-aei-brookings-joint-center-for-regulatory-studies/.

Heatherly, C. L. (Ed.) (1980). *Mandate for Leadership*. Washington D.C.: Heritage Foundation.

Hildenbrand, W. F. (1985). William F. Hildenbrand, Secretary of the Senate, 1981-1985, Oral history by Donald A. Ritchie, Senate Historian. In D. A. Ritchie (Ed.): U.S. Senate Archives.

Hollandsworth, E.M. (2015). *Managing A Complex Public Organization Under Resource Dependency: the Case of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail System*. Virginia Tech Community Change Report 3-3-1 PB, Retrieved from https://vtechworks.lib.vt.edu/bitstream/handle/10919/83851/3-3-1-

Howard, L. C. (1978). Civil Service Reform: A Minority And Women's Perspective. *Public Administration Review, 38* (July-August 1978.), 305-309, July-August 1978.

Kagan, R. A. (2003). *Adversarial Legalism* (Paperback ed. Vol. Le). Cambridge MA: Harvard University Press.

Kendrick, J. W., and Grossman, E. S. (1980). *Productivity in the United States: Trends and Cycles*. Baltimore, MD: John Hopkins University Press.

Kenworthy, E. W. (1970, Sept. 23). Tough New Clean-Air Bill Passed by Senate, 73 to 0. *New York Times*. Retrieved from https://www.nytimes.com/1970/09/23/archives/tough- new-cleanair-bill-passed-by-senate-73-to-0-a-tough-cleanair.html.

Kramer, T. (1982). Comment: Attorney fee awards to noprevailing parties under the Clean Air Act. *University of Cincinnati Law Review, 51 U.* 635.

Lash, J., et al. (1984). *A season of spoils: The Story of the Reagan Administration's Attack on the Environment* Pantheon Books.

Leuchtenberg, W. E. (2009). *Roosevelt and the New Deal*: 1932-1940: Harper Perennial.

Light, Paul (2009). *A Government Ill Executed: The Decline of the Federal Service and How to Reverse It*: Harvard University Press.

Magaziner, I. C., and Reich, R. B. (1982). *Minding America's Business: The Decline and Rise of the American Economy*: Harcourt Brace Jovanovich.

Manheim, F. T. (2008). Talk Without Yelling: Review of Earth: *The Sequel. The Race to Reinvent Energy and Stop Global Warming*, by Fred Krupp and Miriam Horn. Norton, New York, Science Magazine, 322.(5900), 377.

Manheim, F. T. (2009). *The Conflict over Environmental Regulation in the United States: Origin, Outcomes, and Comparison with the EU and Foreign Regions*. New York: Springer Publishing Co.

Manheim, F. T. (2014a, July 17). Howard Baker on Nonpartisan vs. Bipartisan Legislation *SSRN Working Paper*. Retrieved from http://ssrn.com/abstract=2467931.

Manheim, F. T. (2014b). A New Classification of U.S. Environmental Laws. SSRN Working Paper. Retrieved from http://ssrn.com/abstract=2420191.

Manheim, F. T., and Fuhs, G. (2007). An Annotated Database of U.S. Federal Environmental Laws. School of Public Policy, George Mason University, unpublished database in EXCEL.

McGarity, T. O. (1986). Regulatory Reform in the Reagan Era. MD Law Review, , 45(2), 253-273. Retrieved from http://digitalcommons.law.umaryland.edu/mlr/vol45/iss2/3.

McGarity, T. O. (1991). *Reinventing Rationality: The Role of Regulatory Analysis in the Federal Bureaucracy*: Cambridge University Press.

Mankiw, N. G., and Swagel, P. (2006). The politics and economics of offshore outsourcing (12398). *National Bureau of Economic Research Working Paper*. Retrieved from http://www.nber.org/papers/w12398.

McLaughlin, P., and Sherouse, O. (2015, Aug. 3). The Accumulation Of Regulatory Restrictions Across Presidential Administrations. *Mercatus Center, George Mason University.* Retrieved from http://mercatus.org/publication/accumulation-regulatory-restrictions-across-presidential-administrations.

Melnick, R. S. (1983). *Regulation and the Courts: The Case of the Clean Air Act*: Brookings

Institution Press.
Miller, S. (2013, May). EPA's Retrospective Review of Regulations: Will it Reduce Manufacturing Burdens? *Working Paper.* Columbian Regulatory Studies Center, George Washington University. Retrieved from https://regulatorystudies.columbian.gwu.edu/sites/g/files/zaxdzs1866/f/downloads/Miller_EPA_Retrospective_Review.pdf.
Moran, A. (Ed.) (2015). *Climate Change The Facts*. Woodsville NH: Stockade Books Morrill.
(N/A). Transcript of the Morrill Act. Retrieved from https://www.ourdocuments.gov/doc.php?flash=falseanddoc=33andpage=transcript rtBody;col1.
NACWA. (2006, 2007). Peak Performance Awards Platinum; *Milwaukee Metropolitan Sewerage District, Wis.* Jones Island Wastewater Treatment Plant Retrieved from http://nacwa.org/index.php?searchword=Milwaukeeandoption=com_searchandItemid=
Nader, R., and Esposito, J. C. (1970). *Vanishing Air*: Grossman Publishers.
Obama, B. (2016, Mar. 31). I've got a pen and telephone. Retrieved from https://m.youtube.com/watch?v=G6tOgF_w-y.
Pfiffner, J. P., and Brook, D. A. (Eds.). (2000). *The Future of Merit: Twenty Years After the Civil Service Reform Act*: The Johns Hopkins University Press.
Pike, J. (2006, December 10, 2002). Black hole of Boston. *Insight on the News* Retrieved from http://findarticles.com/p/articles/mi_m1571/is_42_18?pnum=9andopg=95150321andtag=a
Popovich, N., et al. (2020, May 6). The Trump administration Is Reversing Nearly 100 Environmental Rules. Here's the Full list. *New York Times*. Retrieved from www.nytimes.com/interactive/2020/climate.
Pring, G., and Pring, C. (2016). *Environmental Courts and Tribunals: A Guide for Policy Makers*: United Nations Environmental Programme.
Ranogajec, P. (2020). Van Alen: The Chrysler building. Khan Academy.org. Retrieved from https://www.khanacademy.org/humanities/art-1010/architecture-design/ny-skyscrapers-landmarks/a/van-alen-chrysler-building.
Reuss, M. (1999). Andrew Atkinson Humphreys and the Development of Hydraulic Engineering. In *American National Biography* (Vol. 11): Oxford University Press.
Rinde, M. (2017). *Richard Nixon and the Rise of American Environmentalism*: Science History Institute.
Rosen, B. (1978). Merit and the President's Plan for Changing the Civil Service System. *Public Administration Review* 38(4): 301-304.
Rowthorn, R., and Ramaswamy, R. (1997). Deindustrialization–Its Causes and Implications. *International Monetary Fund Economic Issues 10*.
Sandler, R. and Schoenbrod, D. (2003) *Democracy By Decree*: Yale University Press
Sax, J. L. (1971). *Defending the Environment: A Strategy for Citizen Action*. New York: Knopf.
Schoenbrod, D. (1993). *Power Without Responsibility* Yale University Press.
Schoenbrod, D., Wyman, K. M., & Stewart, R. B. (2010, Feb. 17, 2010). Why Congress must revise the Clean Air Act. Retrieved from https://grist.org/article/2010-02-17-why-congress-must-revise-the-clean-air-act/.
Schoenbrod, D., et al. (2012). *Breaking the logjam : environmental protection that will work*. New

Haven Conn.: Yale University Press.
Shackleton, R. (2013, March). Total Factor Productivity Growth in Historical Perspective. *Congressional Budget Office, Working Paper Series.* Retrieved from http://www.cbo.gov/sites/default/files/113th- congress-2013-2014/workingpaper/44002_TFP_Growth_03-18-2013_1.pdf.
Smith, L. (1942). Alexis de Tocqueville and Public Administration. *Public Administration Review 2*(3), 221-239.
Sundquist, J. L. (1980). The Crisis of Competence in Government. In J. L. Pechman (Ed.), *Setting American Priorities: The Agenda for the 1980s* (2 ed., Vol. 11, pp. 531-563): Brookings Institution.
Sunstein, C. (2011, September 2). *Letter from Cass Sunstein, Administrator of the Office of Information and Regulatory Affairs, Executive Office of President, Office of Management and Budget: to U.S. Environmental Protection Agency Director Lisa Jackson.* Retrieved from http://mercatus.org/publication/accumulation-regulatory-restrictions-across-presidential-administrations.
Toqueville, A. D. (1835). *Democracy in America* (J. T. Schleifer, Trans. E. Nolla Ed. Bilingual French-English ed. Vol. 2). Indianapolis: Liberty Fund.
Ullmann, J. E. (1988). *The Anatomy of Industrial Decline; Productivity, Investment, and Location in U.S. Manufacturing*: Quorum Books.
Tietenberg, T. (1999). Regulatory reform in air pollution control. In W. E. Oates (Ed.), *The RFF Reader in Environmental and Resource Management* (pp. 69-80). Washington, DC: Resources for the Future.
Toqueville, A. D. (1835). *Democracy in Ameria* (J. T. Schleifer, Trans. E. Nolla Ed. Bilingual French-English ed. Vol. 2). Indianapolis: Liberty Fund.
Ullmann, J. E. (1988). *The Anatomy of Industrial Decline; Productivity, Investment, and Location in U.S. Manufacturing*: Quorum Books.
USACE. (2007, Nov. 26, 2007). U. S. Army Corps of Engineers, A Brief History. USCRP. (2018). *The Climate Report: The National Climate Assessment - Impacts, Risks, and Adaptation in the United States*. Retrieved from http://nca2018globalchange.gov.
USCRP. (2018). The Climate Report: The National Climate Assessment - Impacts, Risks, and Adaptation in *the United States*. Retrieved from nca2018globalchange.gov.
Van Riper, P. P. (1958). *History of the Civil Service*: University of Michigan Press.
Van Riper, P. P. (1983). The American Administrative State: Wilson and the Founders - An Unorthodox View. *Public Administration Review Nov. - Dec.*, 477-490.
Vogel, S. (2008). *The Pentagon: A History*: Random House
Watt, J. G. (1981). Speech to Interior Employees; Unpublished U.S. Geological Survey Archives
Wisby, G. (2005, April 8, 2005). Crusader for Clean Lake gets high-level legal help. *Chicago Sun Times,* p. Metro 14.