Comments

Congress and Chaos: Reexamining the Role of Congress in Combating Climate Change

*Ryan Matthews**

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* J.D. Candidate, University of the Pacific, McGeorge School of Law, to be conferred May 2016; B.A., History, University of California, Los Angeles, 2013. I would like to thank my advisor, Professor Stephen McCaffrey, for all of his help, his excellent suggestions, and most of all, his relentless positivity and good humor. I would also like to thank all of the editors whose tireless work made this Comment possible. Finally, I want to thank my parents, who were and remain my first and best teachers.

I. INTRODUCTION

The "butterfly effect," one of the fundamental principles of chaos theory, postulates that small changes in complex systems can lead to massive and, at times, catastrophic results.[1] Scientists studying chaos theory grapple with the multitude of problems arising from vast systemic complexity.[2] The study of chaotic systems presents the challenge of predicting inherently unpredictable phenomena.[3] This amorphous scientific discipline has emerged from efforts to analyze entities like global economies, weather systems, and brain states.[4] The challenge of finding patterns in these systems, however, seems relatively simple when compared with the immense difficulty of implementing predictable changes in them.[5]

The global climate is a prime example of a system to which the principles of chaos theory apply.[6] A litany of factors including the Earth's obliquity, ocean currents, massive polar ice sheets, and greenhouse gases affect weather patterns across the globe.[7] These factors are profoundly interconnected, and small changes in any single variable can create massive fluctuations in all the others that combine to affect global weather systems in myriad ways.[8] Chaos theory principles add depth to the challenge of creating environmental legislation; not only do legislators—the group currently responsible for crafting climate change policy in the United States—have to grapple with scientific issues which fall outside their areas of expertise, but any legislative change they make has the potential to set off new and unforeseeable global effects.[9]

While the interconnectivity of environmental variables creates an opaque picture, climatic trends have become increasingly clear in recent decades.[10] The

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1. *What is Chaos Theory?*, FRACTAL FOUNDATION (Nov. 3, 2014), http://fractalfoundation.org/resources/what-is-chaos-theory/ [hereinafter FRACTAL FOUNDATION] (on file with *The University of the Pacific Law Review*).

2. Arie Uittenbogaard, *Chaos Theory for Beginners: An Introduction*, ABARIM PUBLICATIONS, http://www.abarim-publications.com/ChaosTheoryIntroduction.html#.VDH0vCtdUro (on file with *The University of the Pacific Law Review*).

3. *See* John Matson, *Chaos Theory Simplified: Just Follow the Bouncing Droplet*, SCIENTIFIC AMERICAN (Dec. 23, 2008), *available at* http://www.scientificamerican.com/article/chaos-theory-simplified-droplet/ (on file with the *University of the Pacific Law Review*) (giving an overview of the basics of chaos theory).

4. FRACTAL FOUNDATION, *supra* note 1.

5. *See id.* (discussing the challenges of complex systems).

6. *See* Uittenbogaard, *supra* note 2 (stating that the Chaos Theory "dawn[ed] on people" after the study of a weather model).

7. *See generally* MYLES R. ALLEN ET AL., CLIMATE CHANGE 2014 SYNTHESIS REPORT 3–8 (The Core Writing Team et al. eds., 2015), *available at* https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf (on file with *The University of the Pacific Law Review*) (discussing the current changes in global climate and the various factors that contribute to climate change).

8. *See* FRACTAL FOUNDATION, *supra* note 1 (discussing the connections between climate factors).

9. *See* Uittenbogaard, *supra* note 2 (discussing the ramifications of chaos theory on the behavior of complex systems like the environment).

10. *See* ALLEN ET AL., *supra* note 7, at 2 (discussing observations of a clear warming trend).

Intergovernmental Panel on Climate Change (IPPC) released its fifth Assessment Report in 2014, which "provides a clear and up to date view of the current state of scientific knowledge relevant to climate change."[11] The report goes well beyond acknowledging that global warming is occurring and that humans cause it; it asserts that continued global inaction will lead to severe, irreversible effects.[12] According to the report, the leading cause of climate change is anthropogenic greenhouse gas emissions.[13]

Faced with the increasingly ominous specter of climate change, the effort to implement environmental policy on a national level in the United States continues to lack coherency.[14] The inability of Congress to adopt a cohesive approach to the problem of climate change stems from an inability to agree not just on the best way to attack the issue, but on whether the issue exists at all.[15] This failure to recognize the significance of the issue substantially hinders efforts to tackle it.[16] The Environmental Protection Agency (EPA) administers federal environmental regulation.[17] The Clean Air Act empowered the EPA to regulate the emission of airborne pollutants nationwide in response to widespread air quality deterioration in the 1970s.[18] After multiple frustrated attempts by politicians to implement meaningful legislation to regulate carbon emissions, the EPA declared greenhouse gases, including carbon dioxide, to be pollutants under the Clean Air Act and asserted its power to regulate these gases under that pre-existing law.[19] However, the Supreme Court limited the EPA's power to regulate carbon emitters in *Utility Air Regulatory Group v. Environmental Protection Agency*,[20] ensuring that the need for additional congressional action remains as acute as ever despite the positive impact of the EPA's new regulatory power.[21]

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11. *Fifth Assessment Report (AR5)*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *available at* http://www.ipcc.ch/ (on file with *The University of the Pacific Law Review*).

12. ALLEN ET AL., *supra* note 7, at 7.

13. *See id.* at 3 (stating that the increase in anthropogenic greenhouse gas emissions is "extremely likely to have been the dominant cause of [global] warming since the mid-20th century").

14. *Legislation in the 112th Congress Related to Global Climate Change*, CENTER FOR CLIMATE AND ENERGY SOLUTIONS, http://www.c2es.org/federal/congress/112 (on file with *The University of the Pacific Law Review*).

15. Jeff Spross & Ryan Koronowski, *The Anti-Science Climate Denier Caucus: 113th Congress Edition*, CLIMATEPROGRESS (June 26, 2013, 9:55 AM), http://thinkprogress.org/climate/2013/06/26/2202141/anti-science-climate-denier-caucus-113th-congress-edition/ (on file with *The University of the Pacific Law Review*).

16. *See generally id.* (discussing congressional failure to recognize the importance of anthropogenic climate change).

17. *Our Mission and What We Do*, ENVIRONMENTAL PROTECTION AGENCY, http://www2.epa.gov/aboutepa/our-mission-and-what-we-do (on file with *The University of the Pacific Law Review*).

18. Clean Air Act of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (1970).

19. *See* Util. Air Regulatory Grp. v. Envtl. Prot. Agency, 134 S. Ct. 2427, 2431 (2014) (discussing the EPA's implementation of greenhouse gas regulations).

20. *Id.* at 2431–32.

21. *See generally id.* (refusing to grant the EPA carte blanche authority to regulate carbon emissions).

The "glacial" nature of Congress effectively ensures governmental stability, but poses a serious challenge when attempting to regulate systems governed by principles of chaos theory.[22] The United States faced a similar problem when confronted with seemingly interminable economic volatility in the decades that followed the Civil War.[23] After a series of reactive measures from Congress and other organs of government, and increasing instability through the peak of the Industrial Revolution, Congress passed the Federal Reserve Act in order to delegate the task of managing a chaotic system to a flexible panel of experts in the field.[24] Since then, the Federal Reserve Act has empowered the Federal Reserve to react to the inevitable fluctuations in a chaotic system like the economy with real-time shifts in monetary policy.[25] The Federal Reserve represents a model that could work for the environment as well as the economy.[26] Empaneling experts to address complex scientific issues and empowering them to flexibly and powerfully react to the fluid circumstances characteristic of chaotic systems provides a solution suitable for the challenges presented by climate change.[27]

The economic panics of the second half of the 19th century and the economic volatility of the Industrial Revolution posed serious risks to the stability of the United States[28] However, because climate change poses an imminent threat of irreversible damage to the global environment, it represents a broader and more calamitous challenge.[29] Given the growing importance of global climate change, as well as the complex nature of it, the EPA should be restructured and given more power in order to control carbon emissions in the United States in the same way that the Federal Reserve controls monetary policy.

Part II of this Comment discusses the history of modern environmental policy in the United States.[30] Part III explains the Federal Reserve's success in adapting to the challenges presented by chaos theory in the economic arena.[31] Part IV examines how the Federal Reserve can serve as a model for a reorganized and reinvigorated EPA and suggests that Congress should empower the EPA to

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22. *Glacial Pacing in the Halls of Congress*, LOCAL GOVERNMENTS FOR SUSTAINABILITY, http://www.icleiusa.org/blog/glacial-pacing-in-the-halls-of-congress (on file with *The University of the Pacific Law Review*).

23. *History of the Federal Reserve*, FEDERAL RESERVE EDUCATION, http://www.federalreserveeducation.org/about-the-fed/history/ (on file with *The University of the Pacific Law Review Law Review*).

24. *Id.*; Federal Reserve Act, Pub. L. No. 63-43, § 2, 38 Stat. 251 (1913).

25. Federal Reserve Act, § 13.

26. *See infra* Part IV (arguing that the EPA's authority should be modeled similarly to the Federal Reserve's authority).

27. *See History of the Federal Reserve*, *supra* note 23 (discussing the success of the Federal Reserve); *see also* FRACTAL FOUNDATION, *supra* note 1 (discussing the challenges of chaos theory).

28. *History of the Federal Reserve*, *supra* note 23.

29. *See* ALLEN ET AL., *supra* note 7, at 7 (discussing the pending irreversible effects of climate change).

30. *Infra* Part II.

31. *Infra* Part III.

react to new environmental crises, including the current struggle with anthropogenic climate change, in a flexible and impactful way.[32]

II. MODERN ENVIRONMENTAL PROTECTION IN THE UNITED STATES

This section will discuss the creation of the EPA, the reforms implemented in the Clean Air Act, the regulatory powers vested in the EPA in the aftermath of *Utility Air Regulatory Group v. EPA*, and the current environmental legislation Congress is considering.[33]

A. The Birth of the EPA: The National Environmental Policy Act

The National Environmental Policy Act (NEPA),[34] which established the EPA, has been described as "the most important piece of environmental legislation in our history."[35] NEPA represented the beginning of a new era of federal policy reflecting a revolutionary prioritization of environmental protection.[36] The 1960s saw an increasingly concerned public rally around the environmentalist banner, driven by growing fear of environmental deterioration, the wild popularity of Rachel Carson's *Silent Spring*, and widespread disillusionment created by the Vietnam War.[37] The increasing public sentiment in favor of serious environmental protection culminated in 1970 with NEPA's passage.[38]

The law's passage empowered the new administrative agency to engage in a multitude of activities promoting a healthy environment.[39] The EPA's mission statement encompassed creating and enforcing new environmental standards, acting as a leader in environmental research, reinforcing the pro-environmental efforts of other groups, and playing a key role in the executive branch's development of environmental policy.[40] However, despite the far-reaching responsibilities given to the EPA, Congress tasked the organization with more than simply increasing environmental regulation.[41] The passage of NEPA represented a fundamental change in perspective on managing the environment,

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32. *Infra* Part IV.

33. *Infra* Part II.A–C.

34. National Environmental Policy Act of 1969, Pub. L. 91-190, § 2, 83 Stat. 852 (1970).

35. Jack Lewis, *The Birth of EPA*, ENVIRONMENTAL PROTECTION AGENCY (Nov. 1985), http://www.2epa.gov/aboutepa/birth-epa (on file with *The University of the Pacific Law Review*).

36. *Id.*

37. *Id.* at 7–8.

38. *Id.*

39. National Environmental Policy Act § 101.

40. Lewis, *supra* note 35.

41. *See id.* (discussing the role of the EPA as being more than simply regulatory).

ending the piecemeal approach to pollution regulation and creating a new, holistic approach to attacking the problem of pollution.[42]

B. Smiting the Smog in the Sky: The Clean Air Act

Congress enacted the Clean Air Act (CAA) on New Year's Eve in 1970—364 days after the President signed NEPA into law.[43] While NEPA embodied a broad mission statement describing a new policy of holistic environmental protection, Congress tailored the CAA to reverse the rapid deterioration of air quality in the United States.[44] The passage of the CAA targeted automobile emissions in particular, in addition to establishing new Ambient Air Quality Standards and requiring state plans for achieving them and increasing the EPA's enforcement authority.[45]

The CAA underwent two major amendments in 1977 and 1990.[46] The 1977 amendments contained minor adjustments to the 1970 version, but in 1990, with the ambitions of its drafters still unrealized after two decades, Congress overhauled the CAA.[47] That sprawling legislation passed totaled over 800 pages, dwarfing the less than fifty pages taken up by the original CAA twenty years before.[48] To address continued problems with ambient air quality, the CAA amendments created more robust requirements for the attainment of the previously established Ambient Air Quality Standards.[49] In addition, the 1990 amendments created a new program to control nearly 200 toxic pollutants and another program to eliminate chemicals that contributed to stratospheric ozone layer depletion.[50] The EPA tested the limits of its authority under the CAA when it attempted to regulate greenhouse gases in 2014.[51]

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42. *See id.* at 10–11 (discussing President Nixon's emphasis on "viewing the environment as a whole.") (internal quotation marks omitted).

43. *Clean Air Act: 40th Anniversary of the Clean Air Act*, ENVIRONMENTAL PROTECTION AGENCY, http://www.epa.gov/air/caa/40th.html (on file with *The University of the Pacific Law Review*); National Environmental Policy Act of 1969, Pub. L. 91-190, 83 Stat. 852 (1970).

44. *See* Lewis, *supra* note 35 (discussing the passage of the Clean Air Act).

45. Clean Air Act of 1970, Pub. L. No. 91-604, § 108, 84 Stat. 1676 (1970).

46. *History of the Clean Air Act*, ENVIRONMENTAL PROTECTION AGENCY, http://www.epa.gov/air/caa/amendments.html (on file with *The University of the Pacific Law Review*).

47. *Id.* ("[T]he 1977 amendments primarily concerned provisions for the Prevention of Significant Deterioration (PSD) of air quality in areas attaining the [National Ambient Air Quality Standards]"). *See* William Reilly, *The New Clean Air Act: An Environmental Milestone*, 17 EPA J. 2, 3 (1991) (noting the history of amendments to the CAA).

48. Reilly, *supra* note 47, at 3.

49. *See* Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399 (1990).

50. *Id.* at § 103.

51. *See* Util. Air Regulatory Group v. Envtl. Prot. Agency, 134 S. Ct. 2427, 2431 (2014) (discussing the actions of the EPA that plaintiffs challenged in *Utility Air*).

C. *The Limits of Greenhouse Gas Regulation:* Utility Air Regulatory Group v. Environmental Protection Agency

In response to congressional inaction, the EPA took unprecedented steps by attempting to regulate carbon emissions under the CAA.[52] The worsening environmental problems that plagued the years leading up to the 1990 CAA amendments, such as ozone depletion and air pollution, manifested themselves with visible effects, including thick smog layers in cities like Los Angeles.[53] Currently, global warming and the resultant climate changes represent the most prevalent issues.[54] With Congress light years from any kind of meaningful legislative action, the EPA declared carbon dioxide to be an atmospheric pollutant under the CAA and began to regulate greenhouse gas emitters under the existing regulatory scheme.[55]

After the EPA proposed the new regulations—which included subjecting stationary emitters of greenhouse gases like power plants to established permitting requirements—several of the affected emitters sued the EPA alleging that the agency had exceeded the bounds of its authority.[56] The Supreme Court ruled that while some of the EPA's new regulations—including its permitting requirements—exceeded its authority under the CAA, others had not.[57] The holding specified that the EPA had not exceeded its authority in requiring those emitters already subject to permitting to implement Best Available Control Technology (BACT) to control greenhouse gas emissions.[58]

Utility Air Regulatory Group represented a victory for the EPA.[59] Justice Scalia declared that the EPA got "almost everything it wanted in [the] case."[60] Indeed, the EPA sought to control greenhouse gas emissions from stationary facilities, and as Scalia noted, it retained the authority to regulate eighty-three percent of those emissions.[61] However, while Scalia's rosy view of the outcome

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52. Robert Barnes, *Supreme Court: EPA Can Regulate Greenhouse Gas Emissions, With Some Limits*, THE WASH. POST, June 23, 2014, http://www.washingtonpost.com/politics/supreme-court-limits-epas-ability-to-regulate-greenhouse-gas-emissions/2014/06/23/c56fc194-f1b1-11e3-914c-1fbd0614e2d4_story.html (on file with *The University of the Pacific Law Review*); *see also Utility Air*, 134 S. Ct. at 2431 (discussing the challenged actions of the EPA).

53. *See* Reilly, *supra* note 47, at 3 (discussing pollution issues, including smog and carbon monoxide, in Southern California).

54. *See* ALLEN ET AL., *supra* note 7 (discussing the potentially severe and irreversible effects of climate change).

55. *Utility Air*, 134 S. Ct. at 2431.

56. *Id.* at 2432 (holding that the EPA could implement carbon permitting requirements over those stationary emitters which they already regulated for different chemical emissions, but not over those who had not been subject to any prior permitting requirements).

57. *Id.*

58. *Id.*

59. Barnes, *supra* note 52.

60. *Id.*

61. *Id.*

for the EPA is mathematically sound, it fails to take into account the type of regulation that is permissible under *Utility Air Regulatory Group*.[62] BACT does not impose a hard cap on emissions and cannot be used to condemn existing facilities—this regulatory power applies only to the use of controls on emissions emanating from existing facilities.[63] In addition, the EPA remains unable to regulate nearly a fifth of existing stationary emitters using their existing authority under the CAA, and with congressional deliberation continuing to emulate an indecisive tortoise, those sources of greenhouse gases are in little danger of being subjected to any new regulation in the near future.[64]

III. THE MODEL: THE FEDERAL RESERVE AND THE ENDLESS STRUGGLE WITH CHAOS

This section will first discuss the formation, powers, and organization of the Federal Reserve. It will then examine the degree of the Federal Reserve's success in combating the challenges presented by a chaotic system—namely, the economy.

A. The Formation, Powers, and Organization of the Federal Reserve

This subsection will discuss three topics: the formation of the Federal Reserve, the authority Congress granted it, and its organization.

1. The Formation of the Federal Reserve

The global climate is not the first chaotic system the United States has sought to regulate.[65] The debate over how to best manage the nation's economy began at its founding with Alexander Hamilton and Thomas Jefferson arguing vociferously over the wisdom of a national bank.[66] Hamilton's eventual victory resulted in the creation of the first of several iterations of a United States national bank—a tool for economic regulation that Congress and various presidents changed, dissolved, and reconstituted over the course of the next century.[67]

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62. *See Utility Air*, 134 S. Ct. at 2432 (ruling on the types of permissible carbon emission regulation under the CAA).

63. *Id.* at 2431.

64. *See Glacial Pacing in the Halls of Congress*, *supra* note 22 (discussing the slow pace of congressional deliberation on the issue of climate change).

65. *History of the Federal Reserve*, *supra* note 23.

66. Elise Stevens Wilson, *The Battle Over the Bank:* Hamilton v. Jefferson, THE GILDER LEHRMAN INSTITUTE OF AMERICAN HISTORY, http://www.gilderlehrman.org/history-by-era/age-jefferson-and-madison/resources/battle-over-bank-hamilton-v-jefferson (on file with *The University of the Pacific Law Review*).

67. *See History of the Federal Reserve*, *supra* note 23 (discussing the changes made to the central banking system).

The fluctuating means with which the country exerted control over the economy worked with a measured degree of success until the second half of the nineteenth century.[68] At that point, with the country expanding to the west and rapidly industrializing in the east, economic volatility spiked and the United States suffered through a series of economic panics—mini-recessions that felt far from miniature to those who endured them.[69] As the twentieth century began, Congress realized that a more permanent, stable solution was needed.[70] That solution came when Congress enacted the Federal Reserve Act in 1913 and established the Federal Reserve.[71]

2. The Powers of the Federal Reserve

The aforementioned Federal Reserve Act established the Federal Reserve to control monetary policy in the United States.[72] The bill's stated purpose was to "establish a more effective supervision of banking in the United States," and in pursuit of this goal, it authorized the Federal Reserve Board to actively issue and retire Federal Reserve notes.[73] Congress tasked the Board with using this power to manage inflation and keep a stable currency environment in the United States.[74] Congress also made the Federal Reserve a "lender of last resort," meant to provide liquidity during periods of economic contraction.[75]

In 1977, Congress entrusted the Federal Reserve with a new mission: to "maintain long run growth of the monetary and credit aggregates commensurate with the economy's long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates."[76] This expanded purpose effectively placed the welfare of key economic indicators—unemployment, inflation, and interest rates—in the hands of the Federal Reserve Board and its subsidiary banks.[77] The 1977 legislation does not preclude Congress from taking additional legislative action to intervene in Federal Reserve policies; indeed, Congress did just that when it passed the Emergency Economic Stabilization Act of 2008 during the depths of the most recent financial crisis.[78] However, the congressional expansion of

68. *See id.* (discussing the history of central banking in the United States).

69. *See id.* (discussing the economic volatility of the second half of the nineteenth century).

70. *See id.* (discussing the problems facing the national economy in the years leading up to the Federal Reserve Act).

71. Federal Reserve Act, Pub. L. No. 63-43, § 1, 138 Stat. 251 (1913).

72. *Id.*

73. *Id.* at § 13.

74. *Id.*

75. Gary Richardson, *The Great Depression*, FEDERAL RESERVE HISTORY, http://www.federalreserve history.org/Period/Essay/10 (on file with *The University of the Pacific Law Review*).

76. 12 U.S.C. § 225(a) (1977).

77. *See id.* (tasking the Federal Reserve with additional responsibilities).

78. Emergency Economic Stabilization Act, Pub. L. No. 110-343, 122 Stat. 3765 (2008).

Federal Reserve power in 1977 allowed the organization to react flexibly to economic fluctuation with a wide range of tools in order to promote economic stability and health in the United States.[79]

3. The Organization of the Federal Reserve

The Federal Reserve Act primarily created the Federal Reserve Banks—twelve banks that would serve as the outposts of the central banking system.[80] An extensive discussion of the functionality of the individual Federal Reserve Banks is beyond the scope of this Comment as this Comment does not advocate structuring the EPA into regional policy divisions.[81] The group assigned to oversee the twelve banks plays a more important role in the future envisioned for the EPA—the Federal Reserve Board.[82]

Seven members make up the Federal Reserve Board.[83] Two of these members must be the Secretary of the Treasury and the Comptroller of the Currency, and the President appoints and the Senate confirms the remaining five members.[84] The Federal Reserve Act designed the appointments so that each Presidential appointee serves a single fourteen-year term.[85] The length of these terms reflects a desire to foster a degree of political independence for Board members.[86] The Federal Reserve Act laid out additional requirements for Board members.[87] The Act requires that at least two of the presidential appointees have a background in finance or banking.[88] However, the Board is not intended to be a group of bankers; the appointees are meant to represent a broad swath of commercial, agricultural, and industrial interests that span the breadth of the country.[89] Additionally, no Board member may hold any form of employment with a bank during their term or hold stock in any financial institution.[90] These requirements are designed to ensure that the members of the Federal Reserve Board have the financial acumen to effectively govern the nation's monetary policy while

79. *See* 12 U.S.C. § 225(a) (discussing the new authority of the Federal Reserve).

80. *History of the Federal Reserve*, *supra* note 23.

81. *See* Part I, *supra* (defining the purpose of this Comment).

82. *See* Federal Reserve Act, Pub. L. No. 63-43, § 10–11, 138 Stat. 251 (1913) (discussing the formation of the Federal Reserve Board).

83. *Id.* at § 10.

84. *Id.* at § 10.

85. 12 U.S.C.A. § 241 (2015).

86. *Board of Governors of the Federal Reserve System*, FEDERAL RESERVE BANK OF NEW YORK (Nov. 2008), http://newyorkfed.org/aboutthefed/fedpoint/fed46.html (on file with *The University of the Pacific Law Review*).

87. *See* Federal Reserve Act §10 (discussing the qualification requirements for members of the Federal Reserve Board).

88. *Id.*

89. *Board of Governors of the Federal Reserve System, supra* note 86.

90. *See* Federal Reserve Act §10 ("The five members of the Federal Reserve Board . . . shall devote their entire time to the business of the Federal Reserve Board.").

attempting to stave off the specter of corrupt bank officials using Federal Reserve appointments for personal benefit.[91]

B. The Federal Reserve's Record Against Chaos

While the mission of promoting economic health and long-term stability evokes optimism, some critics have questioned how successful the Federal Reserve has been since its inception.[92] Critics note that the Federal Reserve has failed to limit inflation, especially when compared with inflation levels in the decades before its inception.[93] These skeptics also point to other economic indicators to show what they believe to be the general failure of the Federal Reserve to achieve its mission.[94]

An in-depth analysis of the economic nuances of the Federal Reserve's record is beyond the scope of this Comment; however, because of its use as a model for the future of the EPA, some analysis of the Federal Reserve's success in combating economic crises is necessary.[95] The Federal Reserve's first opportunity to confront a major economic crisis proved to be the greatest failure in its history.[96] The Great Depression was the greatest economic disaster in American history, and the Federal Reserve exacerbated the situation through a series of poor policy choices.[97] As former Federal Reserve Chairman Ben Bernanke admitted in a 2002 speech, "[r]egarding the Great Depression, . . . we did it. We're very sorry . . . [and] we won't do it again."[98] The Federal Reserve's failure in reacting to the Great Depression was one of mistaken policy rather than inaction.[99] First, the Federal Reserve raised interest rates in 1928, 1929, and 1931, which created disastrous results in an already contracting credit market. Second,

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91. *See id.* (discussing the requirements to be a member of the Federal Reserve Board).

92. *See generally* George Selgin, William Lastrapes & Lawrence White, *Has the Fed Been a Failure?*, CATO INSTITUTE (Nov./Dec. 2012), http://www.cato.org/policy-report/novemberdecember-2012/has-fed-been-failure (on file with *The University of the Pacific Law Review*) (criticizing the record of the Federal Reserve).

93. *Id.* From 1790 to 1913, the purchasing power of the dollar decreased by only eight percent, whereas from 1913 to 2012, it increased by over 2,000 percent. *Id.*

94. *See id.* (discussing perceived policy failures of the Federal Reserve).

95. *See supra* Part IV (discussing the use of the Federal Reserve as a model for a more dynamic EPA).

96. *See* Richardson, *supra* note 75 (discussing the actions of the Federal Reserve in relation to the Great Depression).

97. *Id.*

98. Ben Bernanke, Governor, Fed. Reserve Board, Remarks at the Conference to Honor Milton Friedman: On Milton Friedman's Ninetieth Birthday (Nov. 8, 2002) (transcript on file with *The University of the Pacific Law Review*).

99. David C. Wheelock, *Monetary Policy in the Great Depression: What the Fed Did, and Why,* 74 FED. RES. BANK OF ST. LOUIS REV. 3, 27 (1992), *available at* https://research.stlouisfed.org/publications/review/92/03/Depression_Mar_Apr1992.pdf (on file with *The University of the Pacific Law Review*).

it refused to act as a "lender of last resort," further constricting the liquidity of the economy as a whole.[100]

While those decisions were incontrovertibly disastrous, they were policy failures rather than institutional ones.[101] They were not the result of an inability to effect change in the face of a crisis; rather, they represented the flaws of the misguided economic philosophy of President Hoover's Secretary of the Treasury, Andrew Mellon.[102] As such, the failures of the Federal Reserve leading up to and during the Great Depression do not indicate the organization's inability to react to and regulate a chaotic system—instead, they represent isolated policy failures to which any organ of government is prone.[103]

As the Federal Reserve matured, its responses to crises improved.[104] This was particularly true in the years following the 1977 expansion of its purview.[105] The congressional decision to give the Federal Reserve broad discretion and flexibility allowed the organization to react effectively to the volatility and oscillations characteristic of a chaotic system like the economy.[106] The Federal Reserve has had several crucial occasions to exert its influence.[107] It provided much-needed liquidity during the Savings and Loan Crisis of the late 1980s, keeping the minor crisis from becoming something more serious.[108] In the wake of the September 12, 2001 attacks, the Federal Reserve announced that it would remain open and provide credit and capital to the American economy, helping to stem the stock market sell-off that had begun.[109] Finally, the Federal Reserve began a series of transactions with troubled financial institutions in the early 2000s at the outset of the subprime mortgage crisis.[110] This action proved to be the opening steps of a widespread governmental response that culminated in the Emergency Economic Stabilization Act.[111] While the Federal Reserve's actions

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100. *See* Richardson, *supra* note 75 (stating that the Federal Reserve raised interest rates in 1928 and 1929 and repeated this mistake again in 1931 in response to the international financial crisis).

101. *See id.* (discussing the failed policies that exacerbated the Great Depression); *but see id.* (noting that the "decision-making structure was decentralized and often ineffective.").

102. *See id.* (arguing that one of the Federal Reserve's initial failures was its increase in interest rates during the Great Depression); *Andrew W. Mellon*, FEDERAL RESERVE HISTORY, http://www.federalreservehistory.org/People/DetailView/244 (on file with *The University of the Pacific Law Review*) (stating that Mellon, as a member of the Federal Reserve, "favored interest rate hikes").

103. *See* Richardson, *supra* note 75 (noting that the Federal Reserve's contribution to the Great Depression was the result of failed economic policies).

104. *See generally History of the Federal Reserve, supra* note 23 (providing a timeline of financial crises and the Federal Reserves' respective responses).

105. *Id.*

106. 12 U.S.C. § 225(a) (1977); FRACTAL FOUNDATION, *supra* note 1.

107. *See History of the Federal Reserve, supra* note 23 (noting that trading continued one day after the stock market crashed on October 19, 1987).

108. *Id.*

109. *Id.*

110. *Id.*

111. *Id.*; Emergency Economic Stabilization Act, Pub. L. No. 110–343, 122 Stat. 3765 (2008).

were not the only factor, the period following the 1977 expansion of its mission witnessed "the longest peacetime economic expansion" in American history.[112] Volatility is unavoidable in a chaotic system, but the flexibility and broad empowerment afforded to the Federal Reserve in 1977 allows the organization to effectively combat the symptoms of economic chaos.[113]

IV. THE VISION: USING THE FEDERAL RESERVE AS A MODEL FOR A REINVIGORATED EPA

This section discusses the benefits of using the organizational structure and broad empowerment of the Federal Reserve as a model for a new, dynamic EPA that serves as the primary creator of climate change policy for the United States.[114]

A. Starting at the Top: Creating an EPA Board to Oversee Climate Change Policy in the United States

This section will examine two key benefits of creating an EPA board modeled after the Federal Reserve Board: allowing environmental experts to make key policy decisions and reducing gridlock in the decision-making process.

1. The Right Stuff: Trusting Experts with Key Policy Decisions

Appointing experts in finance and economics is one of the cornerstones of the success of the Federal Reserve.[115] The requirement that the Secretary of the Treasury, the Comptroller of the Currency, and two appointees with backgrounds in finance and economics serve on the Federal Reserve Board clearly reflects a congressional desire to entrust critical policy decisions to those who are best suited to make them.[116] Congress understood, both in 1913 and later on in 1977, that allowing great financial and economic minds to craft monetary policy would be vastly preferable to having members of Congress—elected, but with many having no particular expertise in the field—make these decisions.[117]

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112. *History of the Federal Reserve, supra* note 23.

113. *See id.* (discussing the Federal Reserve's responses to numerous financial crises); *see also supra* text accompanying notes 76–77 (discussing the expanded power granted to the Federal Reserve in 1977).

114. *Supra* Part IV.A–C.

115. *See* Federal Reserve Act, Pub. L. No. 63-43, § 10, 38 Stat. 251 (1913) (explaining the requirement that the Secretary of the Treasury, the Comptroller of the Currency, and two appointees with a background in finance serve on the Federal Reserve Board).

116. *See id.* (ensuring that at least four of the seven members would have experience in economics or finance).

117. *See id.* (requiring that board members be experienced in finance and banking and inferring that Congress found these people to be more qualified to make decisions regarding monetary policy).

Whatever the educational makeup of the Congress that passed the Federal Reserve Act, the contemporary Congress is not filled with science experts.[118] A mere eight percent of Congressmembers majored in any sort of science in college, and fewer still are experts in environmental science.[119] The number of Congressmembers that do not acknowledge either the existence of climate change or its anthropogeneity reflects this lack of expertise.[120] More than half of Republican members of the House of Representatives in the 113th Congress either denied the existence of climate change or denied that humans are causing it.[121]

While congressional skepticism in the face of overwhelming scientific evidence is alarming, it is not in and of itself the main reason that this Comment suggests empaneling experts to make policy decisions.[122] Many of those who recognize the imminent nature of the climate change problem have sought solutions that, while well meaning, lack the expertise necessary to create long-term answers for promoting stability in a chaotic system like the global climate.[123] The realization that experts are simply better equipped to attempt to regulate complex systems, like the environment and the economy, led Congress to create the Federal Reserve in 1913.[124] All the benefits realized by leaving monetary policy to experts would translate to empowering experts to answer the complex questions involved in combating climate change.[125]

2. Strength in Small Numbers: Reacting Nimbly to Crises

The Federal Reserve Board's small size also contributes to its success.[126] Some of the organization's best moments have resulted from quick and decisive action in moments of crisis.[127] The Federal Reserve's hair-trigger responses

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118. *See* THE AMERICAN ACADEMY OF ARTS & SCIENCES, HUMANITIES REPORT CARD 2013 (2013), *available at* http://www.humanitiesindicators.org/images/humanitiesReportCard/2013/Factoid_5.pdf [hereinafter HUMANITIES REPORT CARD 2013] (on file with *The University of the Pacific Law Review*) (noting that eight percent of Congress members pursued undergraduate science degrees).

119. *Id.*

120. Spross & Koronowski, *supra* note 15 ("Over 56 percent—133 members—of the current Republican caucus in the House of Representatives deny the basic tenets of climate science.").

121. *Id.*

122. *See id.* (discussing Congress members who do not believe in climate change).

123. *See* FRACTAL FOUNDATION, *supra* note 1 (discussing the complexity of systems like the global climate).

124. *See* Federal Reserve Act, Pub. L. No. 63-43, § 10, 38 Stat. 251 (1913) (empaneling finance and banking experts to manage monetary policy in the United States).

125. *See History of the Federal Reserve, supra* note 23 (noting several of the successes of the Federal Reserve).

126. *See generally id.* (discussing the successes of the Federal Reserve); *see also supra* text accompanying note 83 (discussing the size of the Federal Reserve).

127. *See id.* at 6 (noting the successes during the Savings and Loan crisis and in the aftermath of September 11).

during situations like the Savings and Loan Crisis of the 1980s and the aftermath of the attacks on September 11, 2001 helped maintain a greater degree of stability than would otherwise have been possible.[128]

The climate change crisis is entirely different from the lightning-quick changes characteristic of the economic panics that Congress designed the Federal Reserve to combat.[129] While climate change will continue to span decades, economic crises can begin and end in hours.[130] Still, while environmental crises may develop slowly, they can still necessitate swift and decisive action.[131] During the 1970s, it became clear that chemicals called chlorofluorocarbons (CFCs) were damaging the stratospheric ozone layer.[132] In the 1980s, it was announced that the damage to the ozone layer would be significant if the world continued to use the chemicals.[133] Even after further investigation revealed that the damage was more significant than originally thought, it took until 1996 for governments in developing countries to finally phase out CFCs.[134] Global cooperative efforts averted the crisis after significant ozone depletion; it appears that natural atmospheric process will restore the ozone layer in the next fifty years.[135]

While CFCs did not cause permanent damage, the United States' failure to cobble together an adequate response to the crisis for a full twenty years after it became apparent that the chemicals were dangerous is alarming.[136] As the dangers of climate change have become clearer and more imminent, the congressional response has taken the same torpid pace.[137] While Congress has been unable to come to anything resembling a consensus on how to address the problem, a smaller body resembling the Federal Reserve Board would have a much greater chance of reaching an agreement.[138] Despite the differentiated pacing of environmental and economic problems, the benefits of quick and decisive action

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128. *History of the Federal Reserve, supra* note 23.

129. *See generally* ALLEN ET AL., *supra* note 7, at 3 (depicting the slow but inexorable nature of the climate change crisis); *see also History of the Federal Reserve*, *supra* note 23 (describing nineteenth century economic panics).

130. *See* ALLEN ET AL., *supra* note 7, at 3 (illustrating the chronological scope of the climate change issue); *see* Richardson, *supra* note 75 (describing the stock market crash).

131. *See also Ozone Science: The Facts Behind the Phaseout*, ENVIRONMENTAL PROTECTION AGENCY, http://www.epa.gov/ozone/science/sc_fact.html (last updated Aug. 19, 2010) (on file with *The University of the Pacific Law Review*) (discussing the chlorofluorocarbon ozone crisis).

132. *Id.*

133. *See id.* (stating that measurements showed the ozone layer had been damaged more than expected and inferring that such action would continue if action was not taken to reduce CFCs).

134. *Id.*

135. *Id.*

136. *Id.*; *see also supra* text accompanying notes 131–35 (discussing the United States' delayed response as well as the possibility of the ozone's natural healing after five decades).

137. *Glacial Pacing in the Halls of Congress*, *supra* note 22.

138. *Id.*; *see History of the Federal Reserve*, *supra* note 23 (noting the quick action taken by the Federal Reserve Board on several occasions).

remain applicable to both.[139] As the Intergovernmental Panel on Climate Change has emphasized, the global climate system is nearing a point of no return—quick and decisive action is exactly what is needed now.[140]

B. Loading the Guns: Arming the New EPA for the Struggle with Chaos

This section discusses the benefits of empowering the EPA in a manner analogous to the Federal Reserve and proposes basic logistical means for doing so.

1. The Benefits of the New Board

The organization of the Federal Reserve Board allows it to react quickly to the crises that inevitably pop up in a chaotic system, but its responses would be impotent without a versatile problem-solving arsenal.[141] The organization's authority to set interest rates, control currency circulation, and regulate its lending flow allows it to attack problems in a variety of ways.[142] Even with its nimble organization, if the Federal Reserve Board had to consult with Congress each time it came upon a new problem for the authority to deal with it, the organization would be rendered completely ineffective.[143]

As the climate change problem has what the IPCC terms "tipping points,"[144] congressional inaction and the Court's ruling in *Utility Air* have hamstrung the EPA's efforts to play a mitigating role.[145] With legislative gridlock grinding ever closer to a total halt, the EPA tried to use the only weapon it had—its authority under the Clean Air Act.[146] While the Court did not entirely condemn the agency's effort to put the decades-old legislation to new use, it did set clear limits on the EPA's power to regulate carbon emissions.[147] The Court left the EPA with a near-empty quiver with which to combat the growing effects of climate change.[148]

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139. *See Ozone Science: The Facts Behind the Phaseout*, *supra* note 131 (discussing the damage that resulted from the United States' failure to respond to the ozone crisis).

140. ALLEN ET AL., *supra* note 7, at 8.

141. *See History of the Federal Reserve*, *supra* note 23 (describing the Federal Reserve's responses to various crises).

142. *See* Federal Reserve Act, Pub. L. No. 63-43, § 11, 38 Stat. 251 (1913) (enumerating the powers of the Federal Reserve); *see also* 12 U.S.C. §225(a) (1977) (describing the authority given to the Federal Reserve).

143. *See Glacial Pacing in the Halls of Congress*, *supra* note 22 (noting the intractability of congressional deliberation and the body's inability to make decisions).

144. ALLEN ET AL., *supra* note 7, at 128.

145. *Glacial Pacing in the Halls of Congress*, *supra* note 22; *see* Util. Air Regulatory Group v. Envtl. Prot. Agency, 134 S. Ct. 2427, 2449 (2014) (holding that the EPA can regulate only some stationary carbon emissions).

146. *See Utility Air*, 134 S. Ct. 2427, 2435 (discussing the actions taken by the EPA).

147. *Id.* at 2449.

148. *See id.* (limiting the EPA's ability to regulate carbon emitters).

If Congress tasked the EPA with a mission statement similar to the one it gave the Federal Reserve in 1977—to promote long-term climate stability—and gave the EPA full regulatory authority over emissions to create such stability, Congress would create a new and improved EPA with the power to steer the world away from the climatic cliff it has been careening towards for the past hundred years.[149] However, Congress should go further than to empower the EPA to regulate greenhouse gases: it should give the EPA both the authority and the mandate to regulate any new pollutants that will affect climate stability in the future.[150]

Congress did not create the Federal Reserve to deal with an individual economic panic.[151] It created the Federal Reserve as a permanent solution that would help promote economic stability.[152] In contrast, Congress established the EPA to combat the growing problem of pollution.[153] NEPA and the CAA aimed to minimize pollution to improve environmental quality and promote human health.[154] The drafters could not have contemplated global climate change at the time of that legislation.[155] Climate change is a new and infinitely more intricate problem that requires a more dynamic solution.[156]

Congress established the Federal Reserve as a dynamic, long-term solution to both the problems of 1913 and those that were yet to come.[157] The solution could adapt to the volatility inherent in a chaotic system; it could adapt to new and unforeseeable problems that could possibly stem from solutions to old ones.[158] That volatility, and the certainty that new and unforeseeable problems will follow this one, is the reason why Congress should empower the EPA to go beyond the problem of greenhouse gas emissions.[159] The EPA should be a dynamic force for long-term climatic stability so that when carbon emissions have been curtailed and global climate catastrophe has been averted, the agency can turn its eyes forward and ensure that the world never approaches a climatic point of no return again.[160]

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149. 12 U.S.C. § 225(a) (1977).

150. *See also* FRACTAL FOUNDATION, *supra* note 1 (discussing the drastic effects that changes can have in complex systems).

151. *See* Federal Reserve Act, Pub. L. No. 63-43, 38 Stat. 251 (1913).

152. *See id.*

153. National Environmental Policy Act of 1969, Pub. L. 91-190, 83 Stat. 852 (1970).

154. Lewis, *supra* note 35.

155. *See id.* (discussing the problems that led to the EPA's creation).

156. *See generally* ALLEN ET AL., *supra* note 7, at 3–8 (noting the intricacies of climate change).

157. Federal Reserve Act pmbl.

158. *See supra* Part III (discussing the ability of the Federal Reserve to manage a chaotic system).

159. *See* FRACTAL FOUNDATION, *supra* note 1 (noting that changes can create extremely unpredictable results in chaotic systems like the environment).

160. *See* ALLEN ET AL., *supra* note 7, at 8 (discussing the imminence of the climate change threat); *see also* FRACTAL FOUNDATION, *supra* note 1 (discussing the inevitability of volatility in a complex system).

2. *Logistics: Putting the Board Together and Empowering It to Battle Chaos*

The reorganized EPA this Comment proposes will mirror the governance structure of the Federal Reserve Board.[161] The decision to make the Federal Reserve Board consist of seven members allows the Board to represent a wide array of policy interests while remaining small enough to be a nimble and decisive body.[162] Modeling the structure of the proposed EPA Board on the Federal Reserve Board would promote these same values.[163] Adapting the Federal Reserve Act requirement that at least two of the Board appointees have a background in banking and finance to requiring a background in environmental law would ensure that the new EPA Board members have the benefit of scientific expertise.[164] In addition, ensuring that the Board members represent a variety of interests beyond pure environmentalism would allay the fears of many whose economic priorities outweigh their environmental concerns and represent a check on the new EPA Board's implementation of environmental policies that could create major negative economic consequences.[165]

A failure to provide sufficient discretionary authority would hamstring the new EPA Board and leave it as powerless to effect real change as the current EPA.[166] The key, then, to enabling this new EPA governance structure to have a legitimate impact on the environment beyond the current crisis of climate change will be to task it with a mission statement similar to the one given to the Federal Reserve in 1970 and to empower it to carry out that mission.[167] The global climate system presents challenges that are greater in both scope and complexity than the global economy; while both are prime examples of chaotic systems, the scale of the climate system and the broad range of variables affecting it render the challenge of regulating it much more daunting.[168]

The nature of chaotic systems suggests that it is a near certainty that anthropogenic climate change caused by greenhouse gas emissions will not be

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161. *See* Federal Reserve Act § 10 (detailing the structure of the Federal Reserve Board).

162. *Board of Governors of the Federal Reserve System*, *supra* note 86.

163. *See id.* (discussing the desire for the Federal Reserve Board to reflect a variety of political and economic interests).

164. *See* Federal Reserve Act § 10 (requiring that at least two of the President's appointees to the Federal Reserve Board have experience in finance or banking).

165. *See* Brian Bennett, *Marco Rubio Says Human Activity Isn't Causing Climate Change*, L.A. TIMES (May 11, 2014, 11:35 AM), http://www.latimes.com/nation/politics/politicsnow/la-pn-rubio-denies-climate-change-20140511-story.html (on file with *The University of the Pacific Law Review*) (noting Senator Rubio's concerns that environmental reform could have major economic consequences).

166. *See* Util. Air Regulatory Group v. Envtl. Prot. Agency, 134 S. Ct. 2427, 2449 (2014) (holding that the EPA lacked authority under the CAA to regulate some sources of greenhouse gas emissions).

167. *See* 12 U.S.C. § 225(a) (1977) (entrusting the Federal Reserve with promoting economic stability through monetary policy).

168. *See generally* ALLEN ET AL., *supra* note 7, at 8 (discussing the scale of the climate change crisis).

the final climatic crisis.[169] However, given the challenges inherent in predicting long-term climatic behavior, it is impossible to say what the next crisis will be.[170] As such, the task of empowering an agency to tackle enigmatic future crises presents substantial difficulties.[171] Given the absence of a crystal ball, the three major atmospheric crises of the last half-century may prove to be instructive.[172] Over the last fifty years, the United States has grappled with three primary atmospheric crises: air pollution in the 1960s and 1970s, tropospheric ozone depletion in the 1980s, and anthropogenic climate change in the 21st century.[173] These three crises share a common cause: chemical emissions.[174] The CAA gave the EPA authority to regulate a wide range of air-polluting chemicals in 1970, and Congress acted independently to ban CFCs in response to the ozone crisis.[175] Both the EPA and Congress have taken baby steps to limit the greenhouse gas emissions that caused the current crisis, but the greater part of the work remains unfinished.[176] In order to empower the new EPA Board to respond to climatic crises that stem in large part from chemical emissions, Congress should give the new EPA authority to regulate all chemical emissions in the United States in order to maintain climatic stability for both current and future generations.[177]

C. Making It Happen: The Challenge of Implementing Environmental Reform in a Hostile Legislative Climate

Despite the attraction of appointing a group of brilliant scientists to save the world from the sins of industrialization and to stand ready to handle whatever counterstroke arises from the rescue, there lies a counterintuitivity in writing on the necessity of congressional action to save the environment from congressional inaction.[178] Congress has not approached an agreement on any kind of climate

169. *See* FRACTAL FOUNDATION, *supra* note 1 (discussing the challenges of chaotic systems).

170. *See id.* (noting the unpredictability of chaotic systems).

171. *See id.* (expounding on the inherent unpredictability of chaos theory).

172. *See* Lewis, *supra* note 35 (discussing the air pollution problems of the 1960s); *see also Ozone Science: The Facts Behind the Phaseout*, *supra* note 131 (discussing the challenges of the ozone depletion crisis); *see generally* ALLEN ET AL., *supra* note 7, at 2–4 (discussing the climate change issue).

173. *See* Lewis, *supra* note 35 (discussing the air pollution problems of the 1960s); *see also Ozone Science: The Facts Behind the Phaseout*, *supra* note 131 (discussing the challenges of the ozone depletion crisis); *see generally* ALLEN ET AL., *supra* note 7, at 4–6 (discussing the climate change issue).

174. *See supra* notes 171–72.

175. *See* Lewis, *supra* note 35 (discussing the air pollution problems of the 1960s); *see also Ozone Science: The Facts Behind the Phaseout*, *supra* note 131 (discussing the challenges of the ozone depletion crisis).

176. Util. Air Regulatory Group v. Envtl. Prot. Agency, 134 S. Ct. 2427, 2449 (2014); ALLEN ET AL., *supra* note 7, at 4–4.

177. *See* ALLEN ET AL., *supra* note 7, at 8 (discussing the imminence of the long-term consequences of the climate change crisis).

178. *See Glacial Pacing in the Halls of Congress*, *supra* note 22 (discussing congressional inaction).

change legislation; it could be called the worst sort of optimism to think that they would now create a revamped and reorganized EPA.[179]

Congressional hostility towards environmental science manifested itself in the EPA Advisory Board Reform Act of 2013, which passed in the House in November 2014.[180] The bill purports to "reform" the EPA Advisory Board to consist of a group of appointed members that advise the EPA Administrator on scientific issues.[181] In an apparent effort to remove biased individuals from consideration, the bill prohibits scientists who have written peer-reviewed work on pertinent scientific subjects from serving on the Board while explicitly permitting individuals with corporate conflicts of interest to serve as long as those conflicts are disclosed.[182] This disclosure requirement furthers the supposed goal of "transparency" that House Republicans have indicated the bill seeks to achieve.[183]

Critics of the bill include the Union of Concerned Scientists, which stated that the bill's provisions "turn[] the idea of conflict of interest on its head, with the bizarre presumption that corporate experts with direct financial interests are not conflicted while academics who work on these issues are."[184] One House Democrat put it "more blunt[ly], telling House Republicans . . . 'I get it, you don't like science. And you don't like science that interferes with the interests of your corporate clients. But we need science to protect public health and the environment.'"[185] It is unclear whether this bill will pass in the Senate, and the White House has already issued a statement vowing to issue a veto if it does pass the second house of the legislature.[186] The bill did not secure a two-thirds majority in the house, so an override of a hypothetical veto is exceedingly unlikely.[187] Still, the support of a provision so hostile to expert involvement in environmental policy making is troubling given that empowering experts to formulate environmental policy is exactly what this Comment suggests.[188]

The Republican victory in the 2014 midterm elections exacerbated the obstacles to meaningful climate change legislation by reinforcing the opponents

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179. *Id.*

180. *H.R. 1422 (113th): EPA Science Advisory Board Reform Act of 2014*, GOVTRACK.US, *available at* https://www.govtrack.us/congress/bills/113/hr1422 [hereinafter *H.R. 1422*] (on file with *The University of the Pacific Law Review*).

181. EPA Science Advisory Board Reform Act of 2014, H.R. 1422, 113th Cong. § 2 (2014).

182. *Id.* at § 2(b).

183. Beverly Mitchell, *House Passes Bill that Prohibits Expert Scientific Advice to the EPA*, INHABITAT (Nov. 20, 2014), http://inhabitat.com/house-passes-bill-that-prohibits-expert-scientific-advice-to-the-epa/ (on file with *The University of the Pacific Law Review*).

184. *Id.* (internal quotes omitted).

185. *Id.*

186. *Id.*

187. *H.R. 1422*, *supra* note 180.

188. *See supra* Part I.

of climate reform in Congress.[189] Since the swearing in of the 114th Congress, far-right Senator Ted Cruz, who has denied the existence of climate change, became the Chairman of the Senate Subcommittee on Space, Science, and Competitiveness.[190] Cruz's fellow GOP member Senator Marco Rubio will now oversee the Senate subcommittee that governs the National Oceanic and Atmospheric Administration.[191] While Rubio has conceded the existence of climate change, he remains convinced that human activity is not causing it.[192]

While it is clear that the current Congress is unlikely to support anything resembling pro-environmental legislation, the focus of this Comment is in line with the proposal it sets forth for the EPA: a long-term solution that looks beyond the isolated problem of climate change.[193] According to the world's leading environmental scientists, the global climate is approaching a tipping point.[194] Still, vainly hoping for a new paradigm of environmental policy from a congressional majority that regards the issue with far less concern is futile.[195] The true power of the solution this Comment suggests will not be mitigated by a delay in its implementation. While the passage of time will make the task of the new EPA more difficult, this solution is aimed at more than just the problem of climate change.[196] This vision for a reinvigorated EPA is predicated on the idea that global climate change is not the last climatic problem that humanity will face.[197] Chaos theory indicates that small changes to the global climate will instigate larger ones, and a massive reduction in greenhouse gas emissions is far from a small change.[198] It is impossible to foresee what the next great environmental challenge will be; the only thing that is certain is that this is not the last mountain that the global community will have to climb.[199] A postponement of a few years will not affect the far-reaching nature of this solution; the fact that this Congress is unlikely to implement it will not eliminate its ultimate usefulness.[200]

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189. *See* Dan Hirschhorn, *Republicans Win the Senate in Midterm Elections*, TIME (Nov. 5, 2014, 7:39 AM), http://time.com/3556003/election-day-midterm-2014-republicans-senate-democrats-obama-mcconnell/ (on file with *The University of the Pacific Law Review*) (stating that Republicans now control both chambers of Congress).

190. Colin Lecher, *Senator Ted Cruz Appointed to Oversee NASA In Congress*, THE VERGE (Jan. 11, 2015, 3:03 PM), http://www.theverge.com/2015/1/11/7528337/senator-ted-cruz-nasa-subcommittee (on file with *The University of the Pacific Law Review*).

191. *Id.*

192. Bennett, *supra* note 165.

193. *See* Mitchell, *supra* note 183 (noting the anti-environmental character of the Congress' actions).

194. *See* ALLEN ET AL., *supra* note 7, at 8 (discussing the potential irreversibility of harm caused by greenhouse emissions).

195. *See* Mitchell, *supra* note 183 (detailing Congress' hostility to pro-environmental policy).

196. *See* ALLEN ET AL., *supra* note 7, at 8 (noting the long-lasting effects of climate change); *supra* Part I.

197. *See supra* Part IV (discussing the vision for the new EPA and the focus on empowering it to address not just this problem, but the ones that arise after it gets solved).

198. FRACTAL FOUNDATION, *supra* note 1.

199. *See id.* (discussing the unpredictability of chaotic systems like the environment).

200. *See* Mitchell, *supra* note 183 (noting the GOP hostility to pro-environmental legislation).

Additionally, a more politically neutral Congress could theoretically enact this solution more easily.[201] The actual changes this Comment suggests offer Congress what amounts to an elegant punt.[202] To implement it, Congress would not have to decide on an actual course of environmental policy.[203] The houses of Congress can disagree on environmental policy to their heart's content. While this Comment advocates taking *an* approach to climate change, it does not presume to offer a scientific solution.[204] Instead, this Comment suggests that Congress delegate the problem to a small group of individuals with more collective knowledge on the topic than the 535 members of Congress combined.[205] The Senate would retain the ability to approve any of the President's appointees, and Congress would not be precluded from passing any sort of environmental policy measure in the future.[206] Congress should do what it did in 1913—it should empower experts in the field to battle a chaotic system that the legislative branch is simply not equipped to handle on its own.[207]

V. CONCLUSION

Science inherently lacks certainty, and the specter of utter unpredictability grows more intimidating in the context of the amorphous science of chaos theory.[208] That inherent uncertainty hinders decisiveness and impairs action.[209] Part of what makes the empowerment of experts so necessary is the unpredictability of global climate change.[210] If a change as small as a butterfly flapping its wings can create drastic changes, what titanic shifts will attempting to reverse global climatic trends create?[211]

The effects of chaos theory are readily apparent in the global economy.[212] Recognizing its inability to react quickly and decisively to increasing economic

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201. *See supra* text accompanying notes 15–16 (discussing Congress' failure to uniformly recognize the issue of climate change and subsequently determine a solution).

202. *See supra* Part IV (offering a solution to the issue of climate change).

203. *See supra* Part IV (arguing that the EPA's authority should be expanded and that Congress should model the organization after the Federal Reserve).

204. *See supra* Part I (suggesting a solution to climate change by reorganizing the EPA).

205. *See* HUMANITIES REPORT CARD 2013 *supra* note 118 (indicating the scientific illiteracy of a stunning number of Congresspeople).

206. *See* Federal Reserve Act, Pub. L. No. 63-43, § 10, 38 Stat. 251 (1913) (laying out the advice and consent principle that would be used to appoint EPA board members).

207. *See id.* (establishing the Federal Reserve and creating the Federal Reserve Board).

208. FRACTAL FOUNDATION, *supra* note 1.

209. *See Glacial Pacing in the Halls of Congress*, *supra* note 22 (discussing congressional inaction); *see also* Spross & Koronowski, *supra* note 15 (discussing how many members of Congress question whether climate change is real).

210. *See supra* Part I (discussing the unpredictability of the global climate).

211. *See* FRACTAL FOUNDATION, *supra* note 1 (discussing the butterfly effect).

212. *See History of the Federal Reserve*, *supra* note 23 (discussing the extreme volatility in the nineteenth century economy).

volatility, Congress established the Federal Reserve and entrusted it with broad discretion to manage American monetary policy and minimize volatility.[213] The considerations that led Congress to establish the Federal Reserve are entirely transferrable to the climate change predicament.[214] The deliberate, measured nature of the legislative branch provides balance and stability for the federal government, but managing chaotic systems requires a different, more nimble hand.[215] Congress is simply not suited to regulate environmental chaos,[216] and should reorganize the EPA and empower it to promote stability and lead the world away from the climatic point of no return.[217]

213. *See generally* Federal Reserve Act, Pub. L. No. 63-43, 38 Stat. 251 (1913) (establishing the Federal Reserve).

214. *See supra* Part IV.

215. FRACTAL FOUNDATION, *supra* note 1 (discussing the unpredictability of chaotic systems).

216. *See* HUMANITIES REPORT CARD 2013, *supra* note 118 (noting the small percentage of Congressmembers with an educational background in science).

217. *Supra* PART 1; ALLEN ET AL., *supra* note 7, at 8 (discussing the severity of climate change).