

The Risk in Discretion: Substantive NEPA’s Significance

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I. INTRODUCTION

Every student of the National Environmental Policy Act (“NEPA”) knows that it is a “procedural” statute. Its practical

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difference as law is to force agencies to take a “hard look” at their proposed actions before taking them.¹ NEPA’s broadest goal—that the government “foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations”—is not, by contrast, *law* to be enforced.² In short, NEPA’s ultimate goal of making American society more sustainable has been marginalized even as its chief procedural tool—the Environmental Impact Statement (“EIS”)—has become ubiquitous. NEPA section 102(2)(C) clearly mandates in a modally unmistakable way that “all agencies of the Federal government,” when taking any “major Federal action[] significantly affecting the quality of the human environment,” prepare an EIS, specifying some of the contents thereof.³ Nothing in the statute even comes close to doing so for its more substantive objectives.

Not long after EISs had taken over NEPA, though, scholars recognized that the Act is much more substantive.⁴ While NEPA sections 101 and 102(1) quickly fell into desuetude, the question has long been asked: can that be changed? As courts made clearer and clearer that it was outside the scope of review to substitute judicial for administrative judgments in the decisions EISs

1. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (stating that NEPA’s “sweeping policy goals” are realized in the requirement that agencies take a “hard look” at their choices); *Stryckers’ Bay v. Karlen*, 444 U.S. 223, 227–28 (1980) (holding that NEPA’s duties are “essentially procedural”); *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976) (finding that the role of reviewing court is to assure agency took NEPA’s required “hard look”).

2. 42 U.S.C. § 4331(a) (2012). Section 4331(a) confirms that its goals are the “continuing policy of the Federal Government, in cooperation with State and local governments” on behalf of “present *and future* generations of Americans.” *Id.* (emphasis added). This merger of “social, economic and other” components of future generations’ welfare is to be pursued by government in “conditions” that foster a “productive harmony” with nature foreshadowed the United Nations’ Brundtland Commission Report’s synthesizing sustainability’s three pillars. See WORLD COMM’N ON ENV’T & DEV., OUR COMMON FUTURE 15–16 (1987) (defining sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own social, economic, and environmental needs).

3. See 42 U.S.C. § 4332(2)(C) (2012).

4. See, e.g., H. Paul Friesema & Paul J. Culhane, *Social Impacts, Politics, and the Environmental Impact Statement Process*, 16 NAT. RESOURCES J. 339 (1976); Note, *The Least Adverse Alternative Approach to Substantive Review Under NEPA*, 88 HARV. L. REV. 735, 747–56 (1975).

informed,⁵ the answer seemed to be a resounding “no.”⁶ By the 1990s, impassioned and inventive arguments that courts should reverse course and retake “substantive” NEPA into judicial review were common.⁷ Proposals directly to the courts that they execute NEPA’s substantive aspects have remained heart-felt but mostly pointless,⁸ for most have ignored underlying legal structure and repeated Supreme Court rejections of any such role for the judiciary.

For all the judicial pronouncements that NEPA is an “essentially procedural” statute, the question remains whether any such pronouncements bind the executive branch, preventing it from putting NEPA’s more substantive aspects into effect. The Supreme Court has held that “[b]efore a judicial construction of a statute . . . may trump an agency’s, the court must hold that the statute unambiguously requires the court’s construction.”⁹ Such holdings need not be expressed in these exact terms,¹⁰ but the Court’s

5. Compare *Calvert Cliffs’ Coordinating Comm. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1115 (D.C. Cir. 1971) (“The reviewing courts probably cannot reverse a substantive decision on its merits, under Section 101, unless it be shown that the actual balance of costs and benefits that was struck was arbitrary or clearly gave insufficient weight to environmental values.”), with *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989) (“[I]t is now well settled that NEPA itself does not mandate particular results, but simply prescribes the necessary process. If the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs.”).

6. See *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 101 (1983); *Strycker’s Bay*, 444 U.S. at 227–28; *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 549–53 (1978).

7. See, e.g., Matthew J. Lindstrom, *Procedures without Purpose: The Withering Away of the National Environmental Policy Act’s Substantive Law*, 20 J. LAND RESOURCES & ENVTL. L. 245 (2000); Paul S. Weiland, *Amending the National Environmental Policy Act: Federal Environmental Protection in the Twenty-First Century*, 12 J. LAND USE & ENVTL. L. 275 (1997) (arguing that Congress should amend NEPA); Philip Weinberg, *It’s Time to Put NEPA Back on Course*, 3 N.Y.U. ENVTL. L.J. 99 (1994) (same); Philip Michael Ferester, *Revitalizing the National Environmental Policy Act: Substantive Law Adaptations from NEPA’s Progeny*, 16 HARV. ENVTL. L. REV. 207, 217 (1992).

8. See, e.g., Harvey Bartlett, *Is NEPA Substantive Review Extinct, or Merely Hibernating? Resurrecting NEPA Section 102(1)*, 13 TUL. ENVTL. L.J. 411 (2000); Joel A. Mintz, *Taking Congress’s Words Seriously: Towards a Sound Construction of NEPA’s Long Overlooked Interpretation Mandate*, 38 ENVTL. L. 1031 (2008).

9. *Nat’l Cable & Telecomms. Ass’n v. Brand X Internet Servs.*, 545 U.S. 967, 985 (2005) (quoting *Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–43 (1984)).

10. See *United States v. Home Concrete & Supply, LLC*, 132 S. Ct. 1836, 1843–44 (2012) (analyzing *Brand X* and agreeing with the Court’s prior opinion).

formula clearly empowers the executive.¹¹ Indeed, a judicial construction only binds as to the “*precise* question at issue.”¹² Are there any such precedents in NEPA’s past? If so, how should they inform the President, whose duty and power it is to “take care” that the “Laws be faithfully executed”?

Part II considers NEPA’s unique fusion of executive and judicial power, the statute’s expressly analytical focus, and our nation’s gradual emergence as a “risk society.”¹³ Part III explores NEPA’s core concept of “significance” and its interpretive record. Part IV sketches the proposed path to a more “substantive” NEPA rooted in a risk-focused interpretation of the statute’s major precedents and ideals. Part V makes the case that NEPA’s interpretive record leaves the President enough power to change its trajectory dramatically. A risk-focused approach that favored quantifying the relevant considerations to the maximum feasible extent could do so. It would focus attention on the worst things first and, consequently, on macro-scaled risks like climate disruption and our individually minor but collectively monumental contributions thereto. Additionally, it would build in mechanisms to spur continuous improvement. The proposal, thus, is for the President to order the Council on Environmental Quality (“CEQ”) and action agencies to begin separately estimating the magnitudes and probabilities of covered actions’ possible effects, any uncertainties therein, and to routinely study their efforts retrospectively. Ultimately, any such agenda must stem from the President’s Article II power over the law’s execution, which is discussed in Part V. Success depends on that execution’s being informed by the limits NEPA has highlighted in its first four decades.

11. See, e.g., *Metro Hosp. v. U.S. Dep’t of Health & Human Servs.*, 712 F.3d 248, 255–56 (6th Cir. 2013) (“[F]ormal Adherence to stare decisis must sometimes yield to the recognition of agency expertise in interpreting statutes that an agency administers.”).

12. Cf. *Metro Hosp.*, 712 F.3d at 257 (“Because a *Chevron* step-one holding is by definition limited to the scope of the ‘*precise* question at issue,’ the *Chevron* step-one holding in [a precedent], if any, is limited to the court’s answer to that question.”) (emphasis added).

13. The sociologist Ulrich Beck coined the phrase “risk society” as a means of describing and explaining the condition of “advanced modernity” in nations like the United States wherein the culture and its institutions are increasingly preoccupied with the hazards and insecurity caused by modernization itself. See e.g., ULRICH BECK, *RISK SOCIETY: TOWARD A NEW MODERNITY* 19–20 (1992) [hereinafter BECK, *RISK SOCIETY*] (“In advanced modernity the social production of wealth is systematically accompanied by the social production of risks.”); see also ULRICH BECK, *ECOLOGICAL POLITICS IN AN AGE OF RISK* (2002); ULRICH BECK, *WORLD AT RISK* (2007).

II. DEFERENCE AND DISCRETION: NEPA'S PLACE IN AGENCY DECISION-MAKING

Within the Supreme Court's modern synthesis, NEPA's substantive policy choices are to be made by the responsible official who is taking "action."¹⁴ From roughly the time of NEPA's enactment to the present, the Court has affirmed that discretionary judgments of the sort governed by NEPA are for the action agency to make,¹⁵ that they are presumptively reviewable,¹⁶ that the review is "narrow but searching," and that the Administrative Procedure Act ("APA") permits scrutiny by a reviewing court of (1) any supporting facts, (2) the rationality of the inferences drawn therefrom, (3) the procedures followed, and (4) the validity of any legal conclusions the agency has drawn.¹⁷ Whatever discretion NEPA leaves to administering officials, thus, judicial review entails a good deal of explanatory transparency and demonstrable rationality—specifically with regard to environmental risk.¹⁸ Section A traces this intersection of discretion and deference. Section B explains how this intersection has come to define the Act.

A. Discretionary Agency Judgments in Judicial Review

In *Citizens to Preserve Overton Park v. Volpe*,¹⁹ the Supreme Court settled that agency policy-making choices are presumptively

14. See *Dep't of Transp. v. Public Citizen*, 541 U.S. 752, 767–69 (2004) (explaining that a NEPA action is one with measurable consequences in the world).

15. See *Andrus v. Sierra Club*, 442 U.S. 347, 356–60 (1979).

16. See *Aberdeen & Rockfish R.R. Co. v. Students Chall. Reg. Agency Procedures*, 422 U.S. 289, 319 (1975); *United States v. Students Chall. Reg. Agency Procedures*, 412 U.S. 669, 694–96 (1973).

17. See *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 516–23 (2009); *Entergy Corp. v. Riverkeeper*, 556 U.S. 208, 216–21 (2009); *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 378 (1989); *Chevron v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 866 (1984); *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto. Ins. Co.*, 463 U.S. 29, 41–57 (1983); *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 103–08 (1983); *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 551–58 (1978); *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 410–21 (1971). Louis Jaffe anticipated this jurisprudence in his opus *Judicial Control of Administrative Action*. See generally LOUIS L. JAFFE, *JUDICIAL CONTROL OF ADMINISTRATIVE ACTION* (1965).

18. See *Vt. Yankee Nuclear Power Corp.*, 435 U.S. at 551–58; *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079 (D.C. Cir. 1973); *Hanly v. Kleindienst*, 471 F.2d 823, 825–32 (2d Cir. 1972); *Calvert Cliffs' Coordinating Comm. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1109 (D.C. Cir. 1971).

19. 401 U.S. 402 (1971).

reviewable pursuant to the APA notwithstanding the fact that they are *discretionary*.²⁰ In *Motor Vehicle Manufacturers Ass'n v. State Farm Mutual Insurance Co.*,²¹ the Court set out a now familiar test for agency arbitrariness in such contexts. In explaining that the scope of this review “is narrow and a court is not to substitute its judgment for that of the agency,”²² Justice White’s opinion sorted out several different dimensions which reviewing courts could identify in the search for agency arbitrariness.

[T]he agency must examine the relevant data and articulate a satisfactory explanation for its action including a ‘rational connection between the facts found and the choice made.’ In reviewing that explanation, we must ‘consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.’ Normally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.²³

The independent reviewability of factual findings and legal conclusions comprising the same “action”²⁴ renders the review of agency reasons and reasoning a hard-to-define category. Discretionary judgment must stand apart from fact and law, although how far apart and in which direction(s) have remained unclear. Such legal discretion has been said to occupy “an intermediate place between choices dictated by purely personal . . .

20. See *id.* at 411–14 (concluding that wherever there is “law to apply,” the APA’s exemption from review of all actions “committed to agency discretion” is inapplicable). Prior to the APA and *Overton Park*’s construction thereof, the reviewability of discretionary judgments in the executive branch was routinely ruled off limits. See, e.g., *United States v. George S. Bush & Co.*, 310 U.S. 371, 379–80 (1940); *Wilbur v. United States*, 281 U.S. 206, 218–19 (1930); cf. JAFFE, *supra* note 17, at 586 (“Discretion, as we have defined the concept, is the power of the administrator to make a choice from among two or more legally valid solutions.”).

21. *State Farm*, 463 U.S. at 29 (1983).

22. *Id.* at 43.

23. *Id.* at 43 (internal citations omitted).

24. *Id.* at 43; see *Bowman Transp., Inc. v. United States*, 419 U.S. 281, 285–86 (1974); *Overton Park*, 401 U.S. at 402, 416. The APA defines “agency action” unhelpfully as “the whole or part of an agency rule, order, license, sanction, relief, or the equivalent or denial thereof, or failure to act.” 5 U.S.C. § 551(13) (2012).

whim and those which are made to give effect to clear methods or reaching clear aims or to conform to rules whose application to the particular case is obvious.”²⁵ Administrative lawyers know this kind of discretion to be an especially troublesome—if not empty—concept.²⁶ True exercises of “enforcement discretion,” for example, are said to be unreviewable under the APA.²⁷ Legal discretion is something left or allocated by law and not necessarily antithetical to it.²⁸

Given that so many discretionary judgments can be reviewed judicially, though, the role of political considerations therein has taken on a unique relevance. The presence of politics, after all, puts the integrity of the *judicial* power at risk.²⁹ Conventional wisdom suggests that *State Farm* blunted the D.C. Circuit’s accumulating precedents charting an aggressive “hard look” review aimed at smoking politics out of these discretionary agency judgments.³⁰ Like *Vermont Yankee* before it³¹ and *Chevron* after it,³²

25. H.L.A. Hart, *Discretion*, 127 HARV. L. REV. 652, 658 (2013).

26. See Peter L. Strauss, “Deference” is too Confusing—Let’s Call them “Chevron Space” and “Skidmore Weight,” 112 COLUM. L. REV. 1143, 1154 (2012); cf. CHRISTOPHER F. EDLEY, JR., ADMINISTRATIVE LAW: RETHINKING JUDICIAL CONTROL OF BUREAUCRACY 192 (1990) (“There is “too much” politics when the agency’s choice is inconsistent with sound application of the nonpolitical methods.”).

27. See, e.g., *Heckler v. Chaney*, 470 U.S. 821 (1985).

28. See Henry P. Monaghan, *Marbury and the Administrative State*, 83 COLUM. L. REV. 1, 29 (1983) (“Jaffe seems to me entirely correct in describing administrative discretion as the process of combining statutorily relevant factors into a decision. There can be ‘no determining rule for combining such factors,’ although a court could properly determine whether one or more factors had been given either excessive or insufficient weight.”) (quoting JAFFE, *supra* note 17, at 556).

29. Cf. *United States v. George S. Bush & Co.*, 310 U.S. 371, 380 (1940) (“It has long been held that where Congress has authorized a public officer to take some specified legislative action when in his judgment that action is necessary or appropriate to carry out the policy of Congress, the judgment of the officer as to the existence of the facts calling for that action is not subject to review.”); Kathryn A. Watts, *Proposing a Place for Politics in Arbitrary and Capricious Review*, 119 YALE L.J. 2, 80–81 (2009).

30. See Matthew Warren, *Active Judging: Judicial Philosophy and the Development of the Hard Look Doctrine in the D.C. Circuit*, 90 GEO. L.J. 2599, 2606–31 (2002). Judge Leventhal’s ‘hard look’—one that he championed both on and off the bench—manipulated the agency’s burden of proof based upon the judge’s understanding of the agency’s evidence, methods, and influences. See Harold Leventhal, *Environmental Decisionmaking and the Role of the Courts*, 122 U. PA. L. REV. 509, 535–37 (1974). If *Vermont Yankee* did not reject this kind of scrutiny, Justice White’s opinion in *State Farm* did. See Richard J. Pierce, Jr., *Waiting for Vermont Yankee III, IV, and V? A Response to Beerman and Lawson*, 75 GEO. WASH. L. REV. 902 (2007).

31. See *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 549–58 (1978) (concluding that the D.C. Circuit’s analysis of agency reasoning and fact finding “borders on the Kafkaesque”).

State Farm chided the court of appeals for exceeding the bounds of judging.³³ Indeed, *State Farm* may have indirectly undercut NEPA's most germinal precedent, *Calvert Cliffs' Coordinating Committee v. AEC*.³⁴ For it arguably limited the depth of judicial scrutiny in cases where agencies were striking trade-offs among competing 'factors.'³⁵ Justice White's formula, which has since become the totem of arbitrariness review,³⁶ vacated the challenged standard much as the court of appeals had.³⁷ It prompted a separate

32. See *Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.* 467 U.S. 837, 842 (1984) (concluding that the D.C. Circuit had committed a "basic legal error" by adopting a "static judicial definition" of the statutory term at issue).

33. See *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto. Ins. Co.*, 463 U.S. 29, 44–45 (1983) (calling the D.C. Circuit's analysis "misguided" and "the inferences it produced . . . questionable"). Judge Mikva's excursion into congressional machinations involving the agency's safety standard, e.g., its attempted repeal, partial repeal, appropriations hearings, etc., was an attempt to create "law to apply" to the agency's action without there being any actual law. Compare *State Farm Mutual Auto. Ins. Co. v. U.S. Dep't of Transp.*, 680 F.2d 206, 218–28 (D.C. Cir. 1982) (citing *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 415) (reviewing legislative history from 1974 amendments, failed bills in congress, failed legislative vetoes, and calling it "legislative history"), with *State Farm*, 463 U.S. at 44 ("The Court of Appeals correctly found that the arbitrary-and-capricious test applied to the rescissions of prior agency regulations, but then erred in intensifying the scope of its review based upon its reading of legislative events.").

34. 449 F.2d 1109 (D.C. Cir. 1971). See A. Dan Tarlock, *The Story of Calvert Cliffs: A Court Construes the National Environmental Policy Act to Create a Powerful Cause of Action*, in ENVIRONMENTAL LAW STORIES 77, 77 (Richard J. Lazarus & Oliver A. Houck eds., 2005); Nicholas C. Yost, *The Background and History of NEPA*, in THE NEPA LITIGATION GUIDE 1, 8 (Albert M. Ferlo et al., eds. 2012) ("No case more pervasively and powerfully shaped the course of NEPA's implementation than the *Calvert Cliffs*' decision.").

35. *Calvert Cliffs*' interpretation of NEPA section 102 as a mandate to action agencies that they analyze their choices with NEPA's environmental quality goals as co-equal considerations arguably rested on an approach to reviewing agency judgment that was rejected by Justice White's opinion in *State Farm*, *Vermont Yankee*, and by even older administrative law doctrines. Compare *Calvert Cliffs*', 449 F.2d at 1115 ("We conclude . . . that [NEPA section 102] mandates a particular sort of careful and informed decisionmaking process and creates judicially enforceable duties."), with *United States v. Morgan*, 313 U.S. 409, 417 (1941) ("To re-examine here with particularity the extensive findings made by the Secretary and to test them by a [voluminous] record . . . would in itself go a long way to convert a contest before the Secretary into one before the courts.").

36. See Note, *Rationalizing Hard Look Review After the Fact*, 122 HARV. L. REV. 1909, 1913 n.31 (2009) (noting that federal courts had invoked his formula more than 500 times by early 2009).

37. See Sidney A. Shapiro & Richard E. Levy, *Judicial Incentives and Indeterminacy in Substantive Review of Administrative Decisions*, 44 DUKE L.J. 1051, 1066 (1995) (noting *State Farm*'s "conflicting messages"). Justice White's majority opinion concluded that the agency's action was arbitrary for not having explored a potential *alternative*—one that might have optimized the statute's disparate goals better than the agency's selected means. See *State Farm*, 463 U.S. at 46–47. Other grounds for the Court's remand remain in doubt as to

opinion from then-Justice Rehnquist who argued that the agency's "changed view" of the standard it was rescinding seemed to stem from "the election of a new President of a different political party" and that a "change in administration brought about by the people casting their votes is a perfectly reasonable basis for an executive agency's reappraisal" of its own judgments.³⁸ Ever since *State Farm*, courts have struggled to fit "politics" into arbitrariness review.³⁹ No court has struggled more obviously than the Supreme Court itself.

It is typically unclear whether a relevant factor is relevant because the law commands it or because the agency has *found* it relevant,⁴⁰ whether from external influences⁴¹ or the agency's own work.⁴² Under the contemporary synthesis, a reviewing court regards an agency's legislation as delegating authority to construe its ambiguities however the agency deems necessary, so long as the agency is administering that statute and its constructions are "reasonable."⁴³ However, with no default methods, the factors that

whether it was an agency "finding" that failed this test or rather the agency's mishandling of the "substantial uncertainty" over how the standard would operate in practice. *Id.* at 51–53.

38. *State Farm*, 463 U.S. at 59 (Rehnquist, J., concurring in part and dissenting in part).

39. Nina A. Mendelson, *Disclosing "Political" Oversight of Agency Decision Making*, 108 MICH. L. REV. 1127 (2010); Thomas J. Miles & Cass R. Sunstein, *The Real World of Arbitrariness Review*, 75 U. CHI. L. REV. 761, 769–73 (2008); Jodi L. Short, *The Political Turn in American Administrative Law: Power, Rationality, and Reasons*, 61 DUKE L.J. 1811 (2012); Watts, *supra* note 29, at 15–23.

40. See Lisa Heinzerling, *Classical Administrative Law in the Era of Presidential Administration*, 92 TEX. L. REV. 171, 173–77 (2014) [hereinafter Heinzerling, *Classical Administrative Law*]; see also JAFFE, *supra* note 17, at 560 ("It is my contention that every case involves a question of 'statutory interpretation' and that every statutory term is only as 'broad' as the court makes it; a 'term' has no inherent character independent of interpretation."); Richard J. Pierce, Jr., *What Factors Can an Agency Consider in Making a Decision?*, 2009 MICH. ST. L. REV. 67, 73–77 (2009).

41. See Lisa Heinzerling, *The FDA's Plan B Fiasco: Lessons for Administrative Law*, 102 GEO. L.J. 927, 973–89 (2014) [hereinafter Heinzerling, *Plan B Fiasco*] (arguing that *Sierra Club* should be revisited because of the opportunity it creates for "political duress" within discretionary agency decisions); see also Heinzerling, *Classical Administrative Law*, *supra* note 40, at 177–80 (citing *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir. 1980), as a "canonical" precedent permitting courts to "sidestep the legal questions surrounding political intervention in rulemaking").

42. See Jamison E. Colburn, *Reasons as Experiments: Judgment and Justification in the "Hard Look,"* 9 CONTEMP. PRAGMATISM 205, 213–19 (2013).

43. See *City of Arlington v. FCC*, 133 S. Ct. 1863 (2013); *United States v. Home Concrete & Supply, LLC*, 132 S. Ct. 1836, 1842–44 (2012); *Mayo Found. for Med. Educ. & Research v. United States*, 562 U.S. 44 (2011); *Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644 (2007); *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 982–83 (2005); *United States v. Mead Corp.*, 533 U.S. 218 (2001); *Chevron U.S.A., Inc. v. Nat. Res.*

“may” be considered are hard to distinguish from those that “shall” or “shall not” be.⁴⁴ The lower courts have identified no standards of delineation.⁴⁵ Thus, the discovery (or construction) of an administered statute’s “factors” has lately become one of the most contentious issues in administrative law.⁴⁶ Whether an agency is involved or not, statutes do not apply themselves⁴⁷ and rarely do they include some “grand matrix”⁴⁸ resolving their priorities amidst the factual uncertainties in the world at large.⁴⁹

Since agencies must explain their *reasoning*,⁵⁰ reviewing courts typically have some expression of these relationships in the record from which they are judging.⁵¹ Sometimes, when the scent of politics is detected in the agency’s deliberations, the Supreme

Def. Council, Inc. 467 U.S. 837, 843–44 (1984); *NLRB v. Hearst Publ’ns*, 322 U.S. 111 (1944); *see also* David Zaring, *Reasonable Agencies*, 96 VA. L. REV. 135 (2010).

44. *See* Pierce, *supra* note 40, at 75; *see also* Michigan v. EPA, 135 S. Ct. 2699, 2714 (2015) (Kagan, J., dissenting); *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 239 (2009) (Stevens, J., dissenting) (disputing the majority’s deference to the agency’s interpretation of permissible choice factors and arguing that the Court “should not treat a provision’s silence as an implicit source of cost-benefit authority, particularly when such authority is elsewhere expressly granted and it has the potential to fundamentally alter an agency’s approach to regulation.”).

45. While the typical disputes in statutory interpretation abound here, the more specific question is: how may or must a reviewing court identify the relevant statutory “factors” in cases of review? *See, e.g.*, *Pension Benefit Guaranty Corp. v. LTV Steel*, 496 U.S. 633, 645–52 (1990) (holding that the agency need not consider factors derived from other, cognate statutes or bodies of law). On that question, the Supreme Court has provided little guidance.

46. *See* Pierce, *supra* note 40.

47. *See* Barbara Baum Levenbook, *How a Statute Applies*, 12 LEGAL THEORY 71 (2006).

48. *See* Hart, *supra* note 25, at 661–64. Hart’s notion of legal discretion, originally presented to an extraordinary group at Harvard Law School in 1956, provided an intellectual spark to many of the formative texts the lawyers and judges of the 1970s, ‘80s, and ‘90s read in law school. *See* Michael C. Dorf, *Legal Indeterminacy and Institutional Design*, 78 N.Y.U. L. REV. 875, 910–13 (2003); Geoffrey C. Shaw, *H.L.A. Hart’s Lost Essay: Discretion and the Legal Process School*, 127 HARV. L. REV. 666, 709–21 (2013).

49. Mendelson, *supra* note 39, at 1129–31; Mark Seidenfeld, *The Irrelevance of Politics to Arbitrary and Capricious Review*, 90 WASH. U. L. REV. 141, 144–45 (2012); Sidney A. Shapiro & Richard Murphy, *Constraining White House Political Control of Agency Rulemaking Through the Duty of Reasoned Explanation*, 48 U.C. DAVIS L. REV. 1457, 1459–75 (2015); Short, *supra* note 39, at 1837–57; Glen Staszewski, *Political Reasons, Deliberative Democracy, and Administrative Law*, 97 IOWA L. REV. 849, 898–99 (2012); Watts, *supra* note 29, at 6.

50. *See* *Sierra Club v. Costle*, 657 F.2d 298, 407–08 (D.C. Cir. 1981); *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 417–20 (1971); *SEC v. Chenery*, 318 U.S. 80, 95 (1943).

51. Agency investment in these explanations and supporting evidence, besides improving courts’ information, can signal substantial political support for a policy choice. *See* Matthew C. Stephenson, *A Costly Signaling Theory of “Hard Look” Judicial Review*, 58 ADMIN. L. REV. 753, 802 (2006).

Court has hoisted it aloft and proclaimed the agency's judgment infected and contrary to law.⁵² However, such "infections" are just as often regarded as harmless, even expected.⁵³ The Court has done nothing to clarify how reviewing courts should identify "the problem" being solved or the "rational connections"⁵⁴ that do or do not support a factor's entering into a target judgment(s).⁵⁵ Harder questions abound. For example, when is a matter of empirical fact one that an agency must prove with evidence? In *FCC v. Fox Television Stations*, the Federal Communications Commission ("FCC") had decided that all television broadcasts of profane words such as "fuck" should be prohibited obscenity in part because their broadcast is harmful to children.⁵⁶ Where the lower court (and the dissent) expected that FCC *prove* that profanity is harmful to children, the majority glibly replied that "[t]here are some propositions for which scant empirical evidence can be marshaled, and the harmful effect of broadcast profanity on children is one of

52. See *Massachusetts v. EPA*, 549 U.S. 497, 533–34 (2007).

53. See *e.g.*, *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 523 (2009). A peculiar correlative has held, as well: sometimes, what had been regarded as a discretionary judgment can be reinterpreted into a strict statutory mandate—for apparently political reasons—which, upon review, can then be granted *Chevron* deference. See *e.g.*, *Nat'l Ass'n of Home Builders v. Defs. of Wildlife*, 551 U.S. 644, 661–73 (2007).

54. Since *State Farm*, a favored formulation has been the requirement of a "rational connection" between "the facts found and the choice made." *Motor Vehicle Mfrs. Ass'n v. State Farm*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)). See, *e.g.*, *HBO v. FCC*, 567 F.2d 9, 35 (D.C. Cir. 1977); *Bowman Transp., Inc. v. Arkansas-Best Freight Sys.*, 419 U.S. 281, 285 (1974). Ironically, *Burlington Truck Lines'* establishment of this 'rational connection' requirement came in the context of formal, on-the-record proceedings and was an interpretation of APA section 8(b). Administrative Procedure Act, 5 U.S.C. § 557(c)(3)(A) (2012) ("The record shall show the ruling on each finding, conclusion, or exception presented. All decisions . . . are a part of the record and shall include a statement of . . . findings and conclusions and the reasons or basis therefor, on all the material issues of fact, law or discretion presented on the record."). Yet the recordation in closed-record proceedings of the "reasons or basis" for the agency's decision including "all the material issues of fact, law or discretion," is not required of agencies engaged in *informal*—open record—proceedings. Cf. *Vt. Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 524–25, 542–46 (1978) (distinguishing between the APA's routines and holding that courts ordinarily may not require agencies to observe more than what is required by statute).

55. After finding that the judgment at issue was not *fully* discretionary, the Court in *Overton Park* said that it must "delineat[e] . . . the scope of the Secretary's authority and discretion" so that the Court could then determine "whether on the facts the Secretary's decision can reasonably be said to be within that range." *Overton Park*, 401 U.S. at 415–16. The perennial confusion from such formulations is where statutory interpretation ends and discretionary judgment begins.

56. *Fox Television Stations*, 566 U.S. at 518.

them.”⁵⁷ Of course, many propositions backed by “scant empirical evidence” are precisely the sort of taken-on-faith findings that should be rejected as arbitrary.⁵⁸

This is why the science and scientific information that agencies log into a record supporting their judgments so regularly eclipses all other aspects of arbitrariness review today.⁵⁹ In *Lead Industries, Inc. v. EPA*,⁶⁰ EPA set an ambient air quality standard for lead on the basis of clinical studies that inconclusively proved the relationship between lead particles in ambient air and blood lead levels.⁶¹ In the course of thoroughly reviewing an informal rulemaking record, the court highlighted one discretionary inference after another.⁶² While it observed that “disagreement among the experts is inevitable when the issues involved are at the ‘very frontiers of scientific knowledge,’” the court nonetheless insisted that it is not a judicial “function to resolve disagreement among the experts or to judge the merits of competing expert views.”⁶³ This “frontiers” notion of agency inferences and of the appropriate judicial deference thereto has featured prominently in

57. *Id.* at 519. Where courts have been willing to root around in—and even supplement—administrative records, they have found “political” meddling under every stone. See Heinzerling, *Plan B Fiasco*, *supra* note 41, at 939–50, 976–89.

58. See, e.g., *Ass’n of Data Processing Serv. Orgs. v. Bd. of Governors, Fed. Reserve Sys.*, 745 F.2d 677, 683–84 (D.C. Cir. 1984) (“When the arbitrary or capricious standard is performing that function of assuring factual support, there is no *substantive* difference between what it requires and what would be required by the substantial evidence test . . .”).

59. *Cf. Ethyl Corp. v. EPA*, 541 F.2d 1, 66 (D.C. Cir. 1976) (Bazelon, J., concurring) (“The process making [sic] a de novo evaluation of the scientific evidence inevitably invites judges of opposing views to make plausible-sounding, but simplistic, judgments of the relative weight to be afforded various pieces of technical data.”).

60. 647 F.2d 1130 (D.C. Cir. 1980).

61. See *id.* at 1136–38.

62. Judge Wright wrote that the clinical studies EPA used to derive its blood-lead/air-lead ratio settled only that that ratio was somewhere between 1:1 and 1:2, i.e., a factor of +/-100%. *Id.* at 1140. Furthermore, EPA was unable to substantiate its estimates of non-air sources’ contribution to blood-lead levels. *Id.* at 1142. Finally, EPA could give no reason why lead-induced “sub-clinical effects” like blood protein elevations were “health” effects within the meaning of the statute rather than some temporary physiological perturbation. *Id.* at 1143 (noting a division of medical opinion).

63. *Id.* at 1160 (quoting *Indus. Union Dep’t, AFL-CIO v. Hodgson*, 499 F.2d 467, 474 (D.C. Cir. 1974)); see also *Ethyl Corp.*, 541 F.2d at 66–68 (Bazelon, J., concurring); *cf. Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 101–06 (1983). The “frontiers of knowledge” trope has haunted arbitrariness review ever since the Supreme Court’s opinion in *Baltimore Gas*. See Emily Hammond Meazell, *Super Deference, the Science Obsession, and Judicial Review as Translation of Agency Science*, 109 MICH. L. REV. 733 (2011). The ‘frontiers of science’ phrase seems to have originated in *Industrial Union Department. Indus. Union Dep’t*, 499 F.2d at 474.

administrative law since, even as courts reserve the right to call any particular such inference *political* and invalid for it.⁶⁴ Of course, if agencies must resolve such differences in their “judgment” and courts must review the rationality of those judgments, what the reviewing court’s role *is* as to agencies’ discretionary inferences from inconclusive evidence,⁶⁵ as to methodological choices,⁶⁶ or as to their internal allocations of authority between different kinds of experts,⁶⁷ remains cryptic at best.

In a famous NEPA decision announced only weeks before *State Farm*, the Court in *Baltimore Gas & Electric Co. v. Natural Resources Defense Council*⁶⁸ suggested that an agency making predictions within its “area of expertise” or at the “frontiers of science” is entitled to *special* deference.⁶⁹ Yet influences from the White House and its appointees along these frontiers have continued to prompt the Court’s fullest scrutiny of agency judgments.⁷⁰ Thus, the precise role that these ‘political’ influences may or should play therein remains enshrouded in considerable doubt.⁷¹

64. See e.g., Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEX. L. REV. 1601, 1604–09 (2008).

65. See David E. Adelman, *Scientific Activism and Restraint: The Interplay of Statistics, Judgment, and Procedure in Environmental Law*, 79 NOTRE DAME L. REV. 497, 541–58 (2004); see also Eric Biber, *Which Science? Whose Science? How Scientific Disciplines Can Shape Environmental Law*, 79 U. CHI. L. REV. 471, 478–87 (2012).

66. See Pasky Pascual et al., *Making Method Visible: Improving the Quality of Science-Based Regulation*, 2 MICH. J. ENVTL. & ADMIN. L. 429, 433–36 (2013).

67. See Elizabeth Magill & Adrian Vermeule, *Allocating Power Within Agencies*, 120 YALE L.J. 1032, 1051–55 (2011); see e.g., David L. Bazelon, *Science and Uncertainty: A Jurist’s View*, 5 HARV. ENVTL. L. REV. 209, 211 (1981) (“In reviewing regulatory decisions, the court does not reweigh the agency’s evidence and reasons. Just as common law courts might leave fact and value questions to the jury, a reviewing court leaves factual conclusions and policy choices to the agency.”); Ronald J. Krotoszynski, Jr., *“History Belongs to the Winners”: The Bazelon-Leventhal Debate and the Continuing Relevance of the Process/Substance Dichotomy in Judicial Review of Agency Action*, 58 ADMIN. L. REV. 995, 1002–04 (2006). The problem of novices judging a battle of the experts is widespread. See Alvin I. Goldman, *Experts: Which Ones Should You Trust?*, 63 PHIL. & PHENOMENOLOGICAL RES. 85, 85–86 (2001).

68. 462 U.S. at 87.

69. *Id.* at 103. See also *Wash. Gas Light Co. v. Fed. Energy Reg. Comm’n*, 532 F.3d 928, 930 (D.C. Cir. 2008) (quoting *Nat’l Comm. for the New River, Inc. v. Fed. Energy Reg. Comm’n*, 373 F.3d 1323, 1327 (D.C. Cir. 2004)).

70. See, e.g., *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 517–20 (2009); *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208 (2009); *Massachusetts v. EPA*, 549 U.S. 497 (2007); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 190–92 (2000) (Breyer, J., dissenting, joined by Stevens, Souter, Ginsburg, JJ.); *Pension Benefit Guar., Corp. v. LTV Corp.*, 496 U.S. 633, 645–46 (1990).

71. Cf. Meazell, *supra* note 63, at 744–56 (arguing that the Court has articulated what seems like extremely deferential tests in cases turning on scientific facts but has not applied

B. NEPA's Place in Discretionary Decisions: Factoring in NEPA's 'Considerations'

NEPA is said to govern agencies' discretionary judgments—that is where and how NEPA applies.⁷² “The touchstone of whether NEPA applies is discretion.”⁷³ NEPA Title I variously addresses “the Federal Government”⁷⁴ and “all agencies of the Federal Government.”⁷⁵ Further, as the Supreme Court has repeatedly intoned, NEPA burdens these agencies with the duty to make “informed”—not necessarily “wise” or “precautionary”—decisions.⁷⁶ The courts have long proven incapable of clarifying much more to

them uniformly); Watts, *supra* note 29, at 56 (“[T]he inherent fuzziness of the line between impermissible and permissible political influences makes it possible that agencies could try to manipulate the line by spinning partisan or raw political decisions as somehow being driven by public values or policy choices.”).

72. See *Flint Ridge Dev. Co. v. Scenic Rivers Assoc. of Okla.*, 426 U.S. 776, 788–90 (1976) (holding that where an agency's governing legislation leaves it no discretion, NEPA does not apply); see also *Calvert Cliffs' Coordinating Comm. v. U.S. Atomic Energy Comm'n*, 449 F.2d 1109, 1115 (D.C. Cir. 1971). “NEPA does not supersede other statutory duties, but, to the extent that it is reconcilable with those duties, it supplements them. Full compliance with its requirements cannot be avoided unless such compliance directly conflicts with other existing statutory duties.” *Env'tl. Def. Fund, Inc. v. Mathews*, 410 F. Supp. 336, 337 (D.D.C. 1976).

73. *Citizens Against Rails-to-Trails v. Surface Transp. Bd.*, 267 F.3d 1144, 1151 (D.C. Cir. 2001). NEPA's *addition* of its factors to the agency's otherwise-controlling choice factors has been interpreted from the qualification of NEPA section 102(2) that it be implemented “to the fullest extent possible.” See *Concerned About Trident v. Rumsfeld*, 555 F.2d 817, 823 (D.C. Cir. 1977).

74. National Environmental Policy Act of 1969 § 101(b), 42 U.S.C. § 4331(b) (2012) (declaring the “continuing responsibility” of “the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources” toward the Act's listed ends).

75. National Environmental Policy Act of 1969 §§ 102(2) 103, 42 U.S.C. §§ 4332(2), 4333 (2012) (addressing their respective duties to “all agencies of the Federal Government.”). Much as section 101(a) declared its “national environmental policy” in relation to “the Nation” as a whole, see 42 U.S.C. § 4331(a) (2012), sections 102 and 103 address “all” agencies equally and in the aggregate. NEPA contains no definition of “agency,” so the default definition of “agency” in context would be the APA's definition. See *Administrative Procedure Act* § 1, 5 U.S.C. § 551(1) (2012) (defining “agency” as “each authority of the Government of the United States,” but not including “(A) the Congress; (B) the courts of the United States; (C) the governments of the territories or possessions of the United States; [and] (D) the government of the District of Columbia”). The Supreme Court has held that the President is not an “agency” within the meaning of the APA. See *Franklin v. Massachusetts*, 505 U.S. 788, 800–01 (1992); cf. *Ground Zero Ctr. for Nonviolent Action v. U.S. Dep't of the Navy*, 383 F.3d 1082, 1089 (9th Cir. 2004) (holding that NEPA does not govern if it is the President's discretionary decision at issue).

76. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350–55 (1989); *Strycker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227–28 (1980); *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 558; (1978).

agencies than that NEPA's objectives are to be factored together with their extant authorities and mandates.⁷⁷ The familiar refrain from the Supreme Court has been that NEPA only requires agencies to take a "hard look" at the environmental consequences of their choices.⁷⁸ To many, this has meant that NEPA is a purely *procedural* statute.⁷⁹ Indeed, the courts have repeated as much for decades.⁸⁰ Whether that is an interpretation of NEPA from which the executive may not deviate is the real question,⁸¹ though, and that is where Part III picks up. It is important to first understand just how intertwined CEQ's administrative interpretations of NEPA have grown with the statute's judicial constructions.

NEPA's most formative judicial construction was that section 102's core legal mandate is balancing decisional factors, including environmental harm.⁸² If *any* interpretation is firmly affixed to

77. See, e.g., *Concerned About Trident v. Rumsfeld*, 555 F.2d 817 (D.C. Cir. 1977) (addressing DOD's maintenance of trident missile systems); *Lathan v. Volpe*, 455 F.2d 1111, 1119–22 (9th Cir. 1971) (addressing Department of Transportation and building of highways); *Comm. for Nuclear Responsibility, Inc. v. Seaborg*, 463 F.2d 796, 798–99 (D.C. Cir. 1971) (addressing Atomic Energy Commission's approval of nuclear test detonation); *Env'tl. Def. Fund, Inc. v. Mathews*, 410 F. Supp. 336 (D.D.C. 1976) (addressing FDA's actions under the Food, Drug and Cosmetic Act); *Nat. Res. Def. Council, Inc. v. SEC*, 389 F. Supp. 689 (D.D.C. 1974) (addressing SEC's securities registration rules).

78. See *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 374 (1989); *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976) (quoting *Nat. Res. Def. Council, Inc. v. Morton*, 458 F.2d 827, 838 (D.C. Cir. 1972)); cf. *Strycker's Bay*, 444 U.S. at 229 (Marshall, J., dissenting) (observing that "the reviewing court must still insure that the agency 'has taken a "hard look" at environmental consequences'") (quoting *Kleppe*, 427 U.S. at 410 n.21).

79. See *Strycker's Bay*, 444 U.S. at 227–28 ("[O]nce an agency has made a decision subject to NEPA's procedural requirements, the only role for a court is to insure that the agency has considered the environmental consequences; it cannot 'interject itself within the area of discretion of the executive as to the choice of the action to be taken.'") (quoting *Kleppe*, 427 U.S. at 410 n.21). This notion arose soon after CEQ began issuing "guidelines" on NEPA's implementation. See, e.g., *Lathan v. Brinegar*, 506 F.2d 677, 688, 693 (9th Cir. 1974). It has long been lamented by NEPA's champions. See Alyson C. Flournoy et al., *Harnessing the Power of Information to Protect Our Public Natural Resource Legacy*, 86 TEX. L. REV. 1575, 1580 (2008) (calling NEPA's "lack of substantive force" its "most frequently identified shortcoming").

80. See Jamison E. Colburn, *Administering the National Environmental Policy Act*, 45 ENVTL. L. REP. 10287 (2015) [hereinafter Colburn, *Administering NEPA*].

81. The Court has held that "a judicial precedent holding that the statute unambiguously forecloses the agency's interpretation . . . displaces a conflicting agency construction." *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 982–83 (2005).

82. See *Flint Ridge Develop. Co. v. Scenic Rivers Ass'n of Okla.*, 426 U.S. 776, 787–88 (1976); *Calvert Cliffs' Coordinating Comm., Inc. v. Atomic Energy Comm'n*, 449 F.2d 1109, 1122–23; (D.C. Cir. 1971); *Volpe*, 455 F.2d at 1120–22. For years, action agencies like the Nuclear Regulatory Commission argued that their enabling statutes implicitly precluded NEPA's entry into otherwise discretionary choices. Reviewing courts consistently rejected such arguments. See, e.g., *Limerick Ecology Action, Inc. v. U.S. Nuclear Reg. Comm'n*, 869

NEPA regardless of executive prerogative, this is it.⁸³ NEPA section 102(2)(C)'s "detailed statement" on alternatives and environmental consequences was (and is) supposed to enable that deliberation wherever the expected environmental harm is "significant."⁸⁴ Indeed, for years it was thought that any agency's judgment against preparing an EIS should draw heightened judicial scrutiny beyond APA arbitrariness review.⁸⁵ Perhaps the hope was that, by encumbering agencies with such a duty to give

F.2d 719, 729–31 (3d Cir. 1989); *Concerned About Trident*, 555 F.2d at 822–24; *City of New York v. United States*, 337 F. Supp. 150, 159–61 (E.D.N.Y. 1972) ("[T]he legislative history indicates that one of the strong motivating forces behind NEPA, and § 102 in particular, was to make exploration and consideration of environmental factors an integral part of the administrative decision-making process.").

83. See, e.g., *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989); *Strycker's Bay*, 444 U.S. at 227–28; *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 550–53 (1978) (acknowledging that the agency must consider environmentally safe alternatives per NEPA, but asserting that the "concept of 'alternatives' is an evolving one, requiring the agency to explore more or fewer alternatives as they become known and better understood"). The earliest NEPA precedents laid this bedrock. See, e.g., *Greene Cty. Planning Bd. v. Fed. Power Comm'n*, 455 F.2d 412, 421–23 (2d Cir. 1972) (asserting that the Federal Power Commissioner should prepare its own environmental draft report before seeking out the help of other agencies, but also implying the environmental discussion before the agency releases its decision); *Calvert Cliffs*, 449 F.2d at 1128 ("It is far more consistent with the purposes of the Act to delay operation at a stage where real environmental protection may come about than at a stage where corrective action may be so costly as to be impossible."); see also *Env'tl. Def. Fund, Inc. v. U.S. Army Corps of Eng'rs*, 492 F.2d 1123, 1128–29 (5th Cir. 1974); *Brinegar*, 506 F.2d at 689; *Life of the Land v. Brinegar*, 485 F.2d 460, 465–66 (9th Cir. 1973); *Md.-Nat'l Capital Park & Planning Comm'n v. U.S. Postal Serv.*, 487 F.2d 1029, 1038–42 (D.C. Cir. 1973) (discussing whether the potential environmental impact was significant and thus whether environmental impact statement was required in the instant case); *Env'tl. Def. Fund, Inc. v. U.S. Army Corps of Eng'rs*, 470 F.2d 289, 295–300 (8th Cir. 1972); *R.I. Comm. on Energy v. Gen. Servs. Admin.*, 397 F. Supp. 41, 55–59 (D.R.I. 1975).

84. See LYNTON K. CALDWELL, *SCIENCE AND THE NATIONAL ENVIRONMENTAL POLICY ACT: REDIRECTING POLICY THROUGH PROCEDURAL REFORM* 75–96 (1982); see e.g., *Monroe Cty. Conserv. Council, Inc. v. Volpe*, 472 F.2d 693, 697–98 (2d Cir. 1972).

85. See, e.g., *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 377–78, 377 n.23 (1989); *Trout Unlimited v. Morton*, 509 F.2d 1276, 1282–83 (9th Cir. 1974); *Minn. Pub. Interest Research Grp. v. Butz*, 498 F.2d 1314, 1319–1320 (8th Cir. 1974). Whether the "reasonableness" standard actually was more searching than the arbitrariness standard, see, e.g., *Save Our Ten Acres v. Kreger*, 472 F.2d 463, 466 (5th Cir. 1973), more deferential, see *id.* at 465, or practically the same, see, e.g., *Manasota-88, Inc. v. Thomas*, 799 F.2d 687, 692–93, 692 nn.7–8 (11th Cir. 1986) ("As a practical matter, we note that the differences between the 'reasonableness' and 'arbitrary and capricious' standards of review are often difficult to discern."), went unresolved until *Marsh* clarified that APA arbitrariness was the standard as to the agency's final judgments. See *Marsh*, 490 U.S. at 375–78, 377 n.23; cf. *Gee v. Boyd*, 471 U.S. 1058, 1058–60 (1985) (White, J., dissenting from denial of cert., joined by Brennan & Marshall, JJ.) (noting the circuit split between a "reasonableness" standard for failures to prepare an EIS and the traditional "arbitrariness" standard).

reasons, the courts could push agencies toward better—or at least better-reasoned—policies.⁸⁶ The Supreme Court squarely rejected that construction in 1989.⁸⁷

For a detailed statement to be due, a proposed “action” must threaten to “significantly” affect the quality of the human environment. This threshold was one which 1970s courts struggled mightily to locate.⁸⁸ NEPA section 102(2)(C)’s use of “significance” as the threshold for the EIS mandate is itself a value choice,⁸⁹ albeit one that is still debated. From the hundreds of reported decisions which had amassed, and President Carter’s Article II, Section 3 power to “take Care” that “the Laws” be faithfully executed, CEQ in 1978 identified a collection of factors construing NEPA’s significance threshold.⁹⁰ In those rules, CEQ stated that “[s]ignificantly as used in NEPA requires considerations of both context and intensity,” and it defined each of these terms with

86. Compare William L. Andreen, *In Pursuit of NEPA’s Promise: The Role of Executive Oversight in the Implementation of Environmental Policy*, 64 IND. L.J. 205, 260 (1989) (“NEPA . . . creates a comprehensive, but flexible mechanism for achieving its goal of more enlightened federal decisionmaking.”), with Kevin M. Stack, *The Constitutional Foundations of Chenery*, 116 YALE L.J. 952, 997–98 (2007) (arguing that *Chenery* and other cases’ demands for reasons from action agencies are a means of enforcing agencies’ duty to act rationally).

87. See *Marsh*, 490 U.S. at 377–80, 377 n.23.

88. Early decisions on the significance threshold include: *Minn. Pub. Interest Research Grp. v. Butz*, 498 F.2d 1314 (8th Cir. 1974); *Rucker v. Willis*, 484 F.2d 158 (4th Cir. 1973); *Scientists’ Inst. for Pub. Info., Inc. v. Atomic Energy Comm’n*, 481 F.2d 1079 (D.C. Cir. 1973); *Hiram Clarke Civic Club, Inc. v. Lynn*, 476 F.2d 421 (5th Cir. 1973); *Monroe Cty. Conserv. Council, Inc. v. Volpe*, 472 F.2d 693 (2d Cir. 1972); *Hanly v. Kleindienst*, 471 F.2d 823 (2d Cir. 1972); *Scherr v. Volpe*, 466 F.2d 1027, 1033 (7th Cir. 1972); *Hanly v. Mitchell*, 460 F.2d 640 (2d Cir. 1972); *Town of Groton v. Laird*, 353 F. Supp. 344 (D. Conn. 1972); *Env’tl. Def. Fund, Inc. v. U.S. Army Corps of Eng’rs*, 348 F. Supp. 916 (N.D. Miss. 1972); *Env’tl. Def. Fund v. Hardin*, 325 F. Supp. 1401 (D.D.C. 1971). Some pre-1978 decisions included “cumulative” impacts in the significance threshold. See *Nat. Res. Def. Council, Inc. v. Callaway*, 524 F.2d 79, 87–88 (2d Cir. 1975); *Sierra Club v. Morton*, 514 F.2d 856, 877–78 (D.C. Cir. 1975), *rev’d sub nom. Kleppe v. Sierra Club*, 427 U.S. 390, 413–14 (1976); *Jones v. Lynn*, 477 F.2d 885, 890–91 (1st Cir. 1973).

89. See, e.g., DANIEL R. MANDELKER, NEPA LAW AND LITIGATION § 8:48 (2015) (discussing the various approaches taken towards determining whether the significance threshold has been met); see also LYNTON K. CALDWELL, THE NATIONAL ENVIRONMENTAL POLICY ACT: AN AGENDA FOR THE FUTURE 30 (1998) [hereinafter CALDWELL, AGENDA]. The qualifications that EISs attend only “major” federal actions which “significantly” affect the environment suggest that, as a decision document, an EIS should not necessarily accompany just *any* decision with environmental ramifications. See *id.* at 61–65.

90. See 40 C.F.R. § 1508.27 (2015); Executive Order 11,991, Relating to Protection and Enhancement of Environmental Quality, 42 Fed. Reg. 26,967 (May 24, 1977). According to CEQ and President Carter’s Executive Order 11,991, the rules are “binding on all Federal agencies,” and are grounded in the President’s Article II, section 3 power. 40 C.F.R. § 1500.3 (2015); Executive Order 11,991, 42 Fed. Reg. at 26,967.

discrete factors.⁹¹ The definition culled more than a dozen such ‘considerations’ from the case law, but it did so without specifying their legal or logical force.⁹² They may be grouped roughly into (1) those bearing on causation and causality,⁹³ (2) those naming certain *legally protected* resources to be considered,⁹⁴ (3) those naming certain other *favoured* resources to be considered,⁹⁵ and (4) those reflecting NEPA’s concern for disclosure generally.⁹⁶ CEQ

91. 40 C.F.R. § 1508.27 (2015); *cf. Kleindienst*, 471 F.2d at 830–31 (holding that “significance” in NEPA involves “(1) the extent to which the action will cause adverse environmental effects in excess of those created by existing uses in the area affected by it, and (2) the absolute quantitative adverse environmental effects of the action itself”).

92. *Cf.* National Environmental Policy Act—Regulations, 43 Fed. Reg. 55,978, 55,988–89 (Nov. 29, 1978) (responding to comments on various definitions, no comments raised or replied to addressing § 1508.27). The 1978 rules set forth a single definition of “significantly” that divided the “considerations” into those about the proposed action’s “context” and those about the “intensity” of its effects. *See* 40 C.F.R. § 1508.27(a). Although the rules were supposed to “address all nine subdivisions of Section 102(2),” National Environmental Policy Act—Regulations, 43 Fed. Reg. at 55,978, the exact relevance of their definition of “[s]ignificantly as used in NEPA,” *See* 40 C.F.R. § 1508.27, beyond the threshold for EISs—especially as a constraint on agency discretion—was left unclear. *Cf.* Carla Mattix & Kathleen Becker, *Scientific Uncertainty Under the National Environmental Policy Act*, 54 ADMIN. L. REV. 1125, 1131 (2002) (stating that CEQ’s factors replaced a “morass” of judicial tests that had accumulated construing “significance”).

93. *See* 40 C.F.R. § 1508.27(a) (requiring analyses to extend to “several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality” and that “[b]oth short- and long-term effects are relevant”); *id.* § 1508.27(b)(5) (noting the official should consider the “degree to which the possible effects . . . are highly uncertain or involve unique or unknown risks”); *id.* § 1508.27(b)(7) (stating that “[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment”).

94. *See* 40 C.F.R. § 1508.27(b)(3) (stating that the official should consider the “proximity to . . . wild and scenic rivers,” presumably referencing the Wild and Scenic Rivers Act of 1968); *id.* § 1508.27(b)(8) (stating that the official should consider the degree to which the action may adversely affect sites and things listed or eligible for listing in the National Register of Historic Places); *id.* § 1508.27(b)(9) (stating that the official should consider the degree to which the action adversely affect a listed endangered or threatened species or its designated critical habitat); *id.* § 1508.27(b)(10) (stating that the official should consider whether the action threatens “violation of Federal, State, or local law or requirements imposed for the protection of the environment”).

95. *See* 40 C.F.R. § 1508.27(b)(2) (stating that the official should consider the degree to which the proposed action “affects public health or safety”); *id.* § 1508.27(b)(3) (stating that the official should consider the “proximity to . . . historic or cultural resources, park lands, prime farmlands, wetlands . . . or ecologically critical areas”); *id.* § 1508.27(b)(8) (stating that the official should consider the degree to which the action “may cause loss or destruction of significant scientific, cultural, or historical resources”).

96. *Cf.* 40 C.F.R. § 1508.27(b)(4) (stating that the official should consider the degree to which the effects on the environment “are likely to be highly controversial”); *id.* § 1508.27(b)(6) (stating that the official should consider “[t]he degree to which the action

said *nothing* about these considerations' relative weights, whether they are additive, or whether any is necessary or sufficient for a significance finding.

In the years since 1978 NEPA "significance" has remained chameleon-like, implying "a spectrum ranging from 'not trivial' through 'appreciable' to 'important' and even 'momentous.'"⁹⁷ The "rule of reason"⁹⁸ which courts developed to review the balancing of these factors has amounted to no legal constraint at all.⁹⁹ (For a time, the D.C. Circuit seemed to bind itself to a unique standard; but it later collapsed its doctrine into a factored version of arbitrariness review of the agency's balancing of CEQ's factors.¹⁰⁰) NEPA "significance" has thus merged with other "hard look" jurisprudence, inextricably intertwining this core NEPA

may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration").

97. See *Kleindienst*, 471 F.2d at 837 (Friendly, J., dissenting); see also *River Road All., Inc. v. U.S. Army Corps of Eng'rs*, 764 F.2d 445, 450–51 (7th Cir. 1985) (reflecting on "significance" and Judge Friendly's dissent).

98. While the so-called 'rule of reason' appeared in some of the earliest NEPA precedents, see, e.g., *Nat. Res. Def. Council, Inc. v. Morton*, 458 F.2d 827, 834 (D.C. Cir. 1972), it became firmly entrenched in law following CEQ's adoption of reasonableness as the governing standard for selecting alternatives, see 40 C.F.R. § 1502.14(a) (2015), for projecting consequences, *id.* § 1502.16(b), for evaluating uncertainty, *id.* § 1502.22(b), for assessing indirect effects, *id.* § 1508.8(b), and for anticipating public involvement, *id.* § 1506.6(b)(2). See, e.g., *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 374 (1989).

99. For discussions, see *Sierra Club v. Marita*, 46 F.3d 606, 621–24 (7th Cir. 1995), *No GWEN All. of Lane Cty., Inc. v. Aldridge*, 855 F.2d 1380, 1385–87 (9th Cir. 1988), and *New York v. U.S. Nuclear Reg. Comm'n*, 681 F.3d 471, 476–77 (D.C. Cir. 2012). The regulations perhaps made the same mistake CEQ's original guidelines were said to have made: they were simply *too* bound up with the standard of review applied in the precedents from which CEQ took their contents. See Robert D. Peltz & Jeffrey Weinman, *NEPA Threshold Determinations: A Framework of Analysis*, 31 U. MIAMI L. REV. 71 (1976).

100. Beginning in *Sierra Club v. Peterson*, 717 F.2d 1409, 1415 (D.C. Cir. 1983), and continuing in *Coalition on Sensible Transport v. Dole*, 826 F.2d 60, 66–67 (D.C. Cir. 1987), *Town of Cave Creek v. FAA*, 325 F.3d 320, 327 (D.C. Cir. 2003), and *Taxpayers of Mich. Against Casinos v. Norton*, 433 F.3d 852, 861 (D.C. Cir. 2005), the D.C. Circuit purported to employ its own four-factored test to review a FONSI—often combining that scrutiny with the caveat that "the binding effect of CEQ regulations is far from clear." See *Taxpayers of Mich. Against Casinos*, 433 F.3d at 861; cf. *City of Alexandria v. Slater*, 198 F.3d 862, 866 n.3 (D.C. Cir. 1999) ("The Council on Environmental Quality has no express regulatory authority under the National Environmental Policy Act . . . instead, the Council was empowered to promulgate binding regulations by President Carter's Executive Order No. 11991 . . . [b]ecause the Administration does not challenge the Council's regulatory authority, we treat the Council's regulations as binding on the agency."). In *Sierra Club v. Antwerp*, 661 F.3d 1147, 1154 (D.C. Cir. 2011), however, the court backed out of the showdown, holding that its test was merely a clarification of arbitrariness review in this specific circumstance. See *id.* at 1154–56 (applying the CEQ factors defining significance in section 1508.27).

concept with arbitrariness review more generally.¹⁰¹ Appellate courts have held, alternatively, that reopening a closed backcountry road could be a “significant” impact on the environment necessitating an EIS¹⁰² while constructing a 225,000 barrel-per-day oil pipeline across the entire breadth of Texas was not necessarily “significant” enough.¹⁰³ These precedents combine to form a precarious equilibrium. In the center is an action agency’s *discretion* under the CEQ rules’ cryptic approach to significance¹⁰⁴—an approach which reviewing courts have, often reluctantly, treated as the authoritative construction of section 102(2)(C).¹⁰⁵ At one limit are the scope and standards of judicial review, especially doctrines affording the most deference for those predictions supposedly within an agency’s expertise and/or which lay at the “frontiers” of knowledge.¹⁰⁶ At the other are the tangibly political motivations so often permeating NEPA decisions.¹⁰⁷ NEPA’s section 102(2)(C)’s unique fusion of judicial and executive authority has held this strange equilibrium together.¹⁰⁸

However, this fusion is increasingly problematic in two ways. First is the threshold’s operation at the outset and second is how it affects the content and relevance of any section 102 “detailed statement.” CEQ’s rules were actively vague on how the factors balance at NEPA’s preliminary stages, i.e., whether to prepare a statement at all.¹⁰⁹ Given the “sorry” state of the law when it

101. See *supra* notes 31–35 and accompanying text.

102. See *Found. for North Amer. Wild Sheep v. U.S. Dep’t of Agric.*, 681 F.2d 1172, 1178–82 (9th Cir. 1982).

103. See *Spiller v. White*, 352 F.2d 235, 245 (5th Cir. 2003).

104. By 1978, commentaries noting problems with NEPA’s threshold determinations were common. See, e.g., FREDERICK R. ANDERSON, *NEPA IN THE COURTS: A LEGAL ANALYSIS OF THE NATIONAL ENVIRONMENTAL POLICY ACT* 156–76 (1973); WILLIAM D. RODGERS, *HANDBOOK ON ENVIRONMENTAL LAW* 750–77 (1977); Thomas O. McGarity, *The Courts, the Agencies, and NEPA Threshold Issues*, 55 TEX. L. REV. 801 (1977); Peltz & Weinman, *supra* note 99. It is, thus, unlikely that CEQ’s indeterminate approach was taken out of ignorance.

105. See Colburn, *Administering NEPA*, *supra* note 80, at 10313–17.

106. See *supra* notes 68–71 and accompanying text.

107. See Amy L. Stein, *Climate Change Under NEPA: Avoiding Cursory Consideration of Greenhouse Gases*, 81 U. COLO. L. REV. 473, 500–18 (2010).

108. Cf. *Jones v. D.C. Redevelop.*, 499 F.2d 502, 512 (D.C. Cir. 1973) (noting that NEPA section 102(2)(C)’s harm is uninformed decision-making and that district courts should therefore use their equitable powers to remedy that harm).

109. Part 1501 of the NEPA regulations names the different NEPA routines, i.e., Categorical Exclusions (“CATX”), Environmental Assessments (“EA”), Findings of No Significant Impact (“FONSI”), programmatic Environmental Impact Statements (“EIS”). 40 C.F.R. § 1501.4 (2015). Part 1508 defines them and other terms. See 40 C.F.R. § 1508

acted,¹¹⁰ CEQ's "definition" was perhaps an improvement.¹¹¹ Nonetheless, its indeterminate approach to NEPA's single most critical concept has not aged well. All the familiar challenges of balancing reasons—their relative weights, commensurability, the place of distinct domain experts, etc.—confound decisions about whether and how NEPA applies.¹¹² Indeed, with the 1978 rules' addition of "cumulative"¹¹³ and other "reasonably foreseeable" "indirect"¹¹⁴ effects to the threshold, the standard is also *normatively* ambiguous.¹¹⁵ So agencies face a perverse incentive to cultivate uncertainties where they know their normative judgments will be challenged.¹¹⁶

(2015). Neither says anything about the proper analytical scope or methods for the threshold NEPA routines of CATXs and FONSI. Thus, it remains logically possible to read CEQ's rule as requiring a reasoned, negative finding on each factor before ruling out an EIS, *see, e.g.*, *Anglers of the Au Sable v. U.S. Forest Serv.*, 565 F. Supp. 2d 812 (E.D. Mich. 2008), and as a totality-of-the-circumstances collection of "considerations." *See, e.g.*, *Coliseum Sq. Ass'n, Inc. v. Jackson*, 465 F.3d 215, 240 (5th Cir. 2006).

110. McGarity, *supra* note 104, at 887.

111. *See* Melanie Fisher, *The CEQ Regulations: New Stage in the Evolution of NEPA*, 3 HARV. ENVTL. L. REV. 347, 350–74 (1979) (comparing court rulings on key NEPA terms to what the 1978 regulations mandated and noting divergences as well as similarities). Perhaps not, though. By 1978, the significance threshold—whether an EIS was required—was NEPA's most litigated issue. *See* COUNCIL ON ENVTL. QUAL., ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 583–88 (1979) (describing litigation in which the main issue was whether an EIS was required).

112. Whether NEPA applies entails some particularized judgment, perhaps a judgment influenced by CEQ's factors more than other relevant factors. *Cf.* Levenbook, *supra* note 47, at 94–100 (arguing that statutes can guide conduct because speakers of a language have the ability to identify act-tokens of a directive in its linguistic and social context). The law has remained unsettled as to whether *other* factors may be weighed by an action agency that weighs *at least* the factors CEQ identifies.

113. *See* 40 C.F.R. §§ 1508.7, 1508.25(c)(3), 1508.27(b)(7) (2015). While the regulations require that an EIS consider direct, indirect, and cumulative impacts, they say nothing about the role of cumulative impacts in threshold "significance" determinations. That has become a major source of discord within the rules. *See* Murray D. Feldman, *Taking a Harder Look at Direct, Indirect, and Cumulative Impacts*, 48 ROCKY MTN. MIN. L. FOUND. J. 319, 330–43 (2011). Within the Ninth Circuit at least, it has elicited more searching judicial review as well. *See id.* at 346–65.

114. *See* 40 C.F.R. § 1508.8(b) (2015); National Environmental Policy Act—Regulations, 43 Fed. Reg. 55,978, 55,988 (Nov. 29 1978) (noting comments on definition of "effects" but making no mention of the inclusion of "indirect" effects therein). At least one precedent, *Scientists' Institute for Public Information v. Atomic Energy Commission*, 481 F.2d 1079 (D.C. Cir. 1973), had required an impact statement as to projected effects that were, by that court's admission, indirect but still "foreseeable." *See id.* at 1090–93; *see also* *City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1975).

115. *See infra* notes 220–222 and accompanying text.

116. An agency's posture toward "uncertainty" might well be a function of litigation planning as opposed to other, first-order considerations. *See* Louis J. Virelli III, *Deconstructing*

Second, because a completed EIS is to analyze all “reasonably foreseeable” and “cumulative” effects,¹¹⁷ as well as all the “reasonable” alternatives to the proposal,¹¹⁸ the appropriate scope of this investigation and analysis is deeply ambiguous. Indeed, what had been normative uncertainty surrounding the aggregation of past effects¹¹⁹ has deepened substantially as climate change has emerged as a focal concern.¹²⁰ Should a routine NEPA document analyze the proposal’s (necessarily minute) contribution to something as immensely scaled and globally contributory as climate disruption?¹²¹ What if it is but one more in a vast succession of “similar” or “connected” actions?¹²² Torn between the two extremes of sensing political motivations versus deferring to relevant expertise, courts and action agencies have divided over what sorts of analytical methods suffice for the *rational* exercise of NEPA discretion.¹²³ Part III considers which interpretations of

Arbitrary and Capricious Review, 92 N.C. L. REV. 721, 745–46 (2014) (suggesting that agencies “manufacture” uncertainty to improve their chances of winning suits challenging their actions).

117. See 40 C.F.R. § 1502.22(a) (2015).

118. *Id.* § 1502.14(a).

119. In 1997 the agency released a comprehensive manual on the consideration of cumulative effects, see COUNCIL ON ENVTL. QUALITY, EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 1–10 (1997) [hereinafter CONSIDERING CUMULATIVE EFFECTS], and in 2005 it released a hastily-drafted interpretive memo addressing several cumulative effects precedents. See Memorandum from James L. Connaughton, Chairman, Council on Env’tl. Quality, to Heads of Federal Agencies, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (June 24, 2005), http://ceq.hss.doe.gov/nepa/regs/Guidance_on_CE.pdf [<https://perma.cc/6UPG-BZ9Y>]. Litigation in the Ninth and Tenth Circuits especially has continued to keep the cumulative effects notion in flux. See Feldman, *supra* note 113, at 324–25, 334–37.

120. See *infra* note 131 and accompanying text.

121. A handful of decisions suggest that it should. See *Ctr. for Bio. Div. v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1216–17 (9th Cir. 2008); *Mid States Coal. for Progress v. Surface Transp. Bd.*, 345 F.3d 520, 549–50 (8th Cir. 2003); *Border Power Plant Working Grp. v. Dep’t of Energy*, 260 F. Supp. 2d 997, 1028–29 (S.D. Cal. 2003). A slightly bigger handful suggests that it need not. See *Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1140 (9th Cir. 2011); *Hapner v. Tidwell*, 621 F.3d 1239, 1245 (9th Cir. 2010); *City of Los Angeles v. NHTSA*, 912 F.2d 478 (D.C. Cir. 1990); *N.C. All. for Transp. Reform, Inc. v. U.S. Dep’t of Transp.*, 713 F. Supp. 491, 519–20 (M.D.N.C. 2010); *Audubon Soc’y v. U.S. Dep’t of Transp.*, 524 F. Supp. 2d 642, 708 (D. Md. 2007).

122. See 40 C.F.R. § 1508.25(a)(1), (a)(3) (2015); cf. *Audubon Soc’y*, 524 F. Supp. 2d at 708 (holding, affirming agency, that while climate change is “an important national and global concern” it was “not useful to ‘consider greenhouse gas emissions as part of the project-level planning and development process’” in highway construction).

123. See Todd S. Aagaard, *A Functional Approach to Risks and Uncertainties Under NEPA*, 1 MICH. J. ENVTL. & ADMIN. L. 87, 95–102 (2012); Mattix & Becker, *supra* note 92, at 1142–64; Richard Lazarus, *The National Environmental Policy Act in the U.S. Supreme Court: A Reappraisal*

NEPA's significance threshold, if any, constrain the executive from implementing a more "substantive" NEPA grounded in risk governance.

III. NEPA SIGNIFICANCE AS A RISK THRESHOLD: SAYING WHAT THE LAW IS

A statute with such an enormous and conflicted interpretive record as NEPA's presents several challenges to a de facto administrator. CEQ's 1978 regulations,¹²⁴ like its original guidelines, draw "their strength from their consolidation of important cases under NEPA, i.e., [being] a codification of judicial interpretation."¹²⁵ If CEQ is to bring focus and purpose to NEPA's substantive aspects and particularly to the Act's handling of risk and uncertainty, thus, it has few good precedents from which to draw and many to navigate around carefully. Part III considers the NEPA interpretations bearing on the principal dimensions of risk assessment: (1) the severity or magnitude of a threat; (2) the probability of that threat's materializing into a harm or loss; and (3) any uncertainty about (1) or (2). While few courts have treated NEPA "significance" as an express function of risk,¹²⁶ many have done so implicitly. And the regulations have done so since 1978. What the regulations have not done is break the choices down into risk assessment's now orthodox elements.¹²⁷ Section A compares the regulations' approach to that analytical orthodoxy. Section B surveys the doctrines bearing upon it.

and Peek Behind the Curtains, 100 GEO. L.J. 1507, 1532 (2012) (arguing that what the Supreme Court has adjudicated about NEPA has been fact-oriented and is likely to remain so given the structure of NEPA litigation).

124. See Colburn, *Administering NEPA*, *supra* note 80, at 10313–17.

125. Herbert F. Stevens, *The Council on Environmental Quality's Guidelines and Their Influence on the National Environmental Policy Act*, 23 CATH. U. L. REV. 547, 573 (1974).

126. *But see* New York v. U.S. Nuclear Reg. Comm'n, 681 F.3d 471, 478 (D.C. Cir. 2012); Blue Mountains Biodiversity Project v. Blackwood, 161 F.3d 1208, 1213–14 (9th Cir. 1998) (using the CEQ "significance" factor of "highly uncertain or . . . unique or unknown risks" to require agency to examine in depth risks known to be of very low probability); Sierra Club v. Watkins, 808 F. Supp. 852, 867 (D.D.C. 1991) (finding in CEQ's rules the requirement that "the actual risk to the environment [be] computed by multiplying the severity of the consequences . . . by the probability that the [event] occur").

127. See Aagaard, *supra* note 123, at 95–102.

A. Risk Assessment in the CEQ Regulations

As mentioned, the regulations include “indirect,” i.e., “reasonably foreseeable,” and “cumulative” impacts for purposes of the significance threshold.¹²⁸ Yet, the inexplicit notion of predicting “effect” or “impact”—which the rules treat synonymously—conflates risk’s two substantive aspects: threat and probability.¹²⁹ A risk-focused approach would segregate these two aspects into their own analytical domains. It would also acknowledge an *epistemic* dimension they share: the treatment of uncertainty.¹³⁰ The conflation of these distinct elements manifests itself in three different problems, occurring both in threshold determinations and in the crafting of EISs and the judgments they inform. First, without expressly differentiating the magnitude of a threat from its likelihood or probability, the 1978 regulations have probably contributed to our general mishandling of “macro”

128. 40 C.F.R. §§ 1508.3, 1508.7, 1508.8, 1508.27 (2015). So-called “cumulative” impact is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions *regardless of what agency . . . or person undertakes such other actions.*” *Id.* § 1508.7 (emphasis added). If “indirect” impacts have given the courts difficulties, “cumulative” impacts have been even more problematic. See Feldman, *supra* note 113, at 334–37.

129. For decades, the National Research Council (“NRC”) has refined a framework of risk analysis rooted in these assumptions. See NAT’L RESEARCH COUNCIL, RISK ASSESSMENT IN THE FEDERAL GOVERNMENT: MANAGING THE PROCESS 7–8 (1983); NAT’L RESEARCH COUNCIL, IMPROVING RISK COMMUNICATION 8–13 (1989); NAT’L RESEARCH COUNCIL, SCIENCE AND JUDGMENT IN RISK ASSESSMENT 23–24 (1994) [hereinafter SCIENCE AND JUDGMENT] (“The increase in the sophistication of the field of risk assessment since the Red Book requires risk assessors to have the ability to recognize and address fully such cross-cutting issues as uncertainty, variability, and aggregation, in addition to having a more overarching view of the practice of risk assessment.”); NAT’L RESEARCH COUNCIL, UNDERSTANDING RISK: INFORMING DECISIONS IN A DEMOCRATIC SOCIETY (1996) [hereinafter UNDERSTANDING RISK]; NAT’L RESEARCH COUNCIL, SCIENCE AND DECISIONS: ADVANCING RISK ASSESSMENT 16–23 (2009) [hereinafter SCIENCE AND DECISIONS] (outlining the history of risk assessment and the current state of risk analysis). NRC’s orthodox approach assumes that overall *risk governance* is rightly divided into three phases or aspects—assessment, management, and communication—and that each has its own practitioners, best practices, etc. See UNDERSTANDING RISK, *supra*, at 1–10 (creating seven principles from which the “characterization of risk” can emerge “from a combination of deliberation and analysis”). This orthodoxy is adopted and taught widely. See THE PRESIDENTIAL/CONG. COMM’N ON RISK ASSESSMENT & RISK MGMT., FINAL REPORT: RISK ASSESSMENT AND RISK MANAGEMENT IN REGULATORY DECISION-MAKING 3–6 (1997) (noting that a “generally accepted framework and nomenclature for health risk management was established in 1983 by a . . . report, *Risk Assessment in the Federal Government: Management in the Process*”).

130. See *infra* notes 234–264 and accompanying text.

environmental risks.¹³¹ Second, without explicit attention to the uncertainty of future consequences separate from their goodness or badness, we remain too susceptible to basic analytical mistakes.¹³² As risk governance has matured, analysts have grown increasingly adept at keeping these largely distinct evaluations from corrupting one another.¹³³ Third, ignoring the distinctions at NEPA section 102(2)(C)'s threshold allows agencies to avoid accounting for their methods and for the consequences of their judgments accruing over time.¹³⁴ Indeed, ignoring the distinctions

131. See Michael P. Vandenberg & Jonathan A. Gilligan, *Macro-Risks: The Challenge for Rational Risk Regulation*, 21 DUKE ENVTL. L. & POL'Y F. 401 (2011). Vandenberg and Gilligan define a "macro" risk as one with the potential to "dramatically disrupt the character of markets and economies on a global scale and for very long times." *Id.* at 409. Where we have often excelled at "micro-risk" analysis, we have generally failed with respect to "macro-risk" analysis and governance. See *id.* at 413–19. Climate change perhaps exemplifies NEPA's blind spot as to the latter—as commentators have reiterated over and over. See, e.g., Michael B. Gerrard, *Climate Change and the Environmental Impact Review Process*, NAT. RESOURCES & ENV'T, Winter 2008, at 20; Lauren Giles Wishnie, *NEPA for a New Century: Climate Change and the Reform of the National Environmental Policy Act*, 16 N.Y.U. ENVTL. L.J. 628 (2008); Madeline June Kass, *A NEPA Climate Paradox: Taking Greenhouse Gas Emissions into Account in Threshold Significance Determinations*, 42 IND. L. REV. 47 (2009); Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 TULANE L. REV. 511 (2013); Stein, *supra* note 107; Alana M. Wase, *Climate Change Impacts and NEPA: Overcoming the Remote and Speculative Defense*, 72 MD. L. REV. 967 (2013).

132. See DANIEL KAHNEMAN, THINKING FAST AND SLOW 4 (2011) (discussing the biases and intuitions that often influence a person's decisions, causing a person to make a wrong decision even where an "objective observer" could detect the apparent error); JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (Daniel Kahneman et al. eds., 1982). Of course, we have no assurance that risk information broken into its components will be correctly interpreted, *cf.* Ellen Peters et al., *Numeracy Skill and the Communication, Comprehension and Use of Risk-Benefit Information*, in THE FEELING OF RISK: NEW PERSPECTIVES ON RISK PERCEPTION 345–46 (Paul Slovic ed., 2010) (noting that even though more health information is available than ever, consumers might not have the necessary skills to assess that information and make truly informed decisions), nor even correctly calculated. See Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STATS. 1 (2009) (proving that certain "fat-tailed" uncertainties might outweigh discounted climate change damage estimates).

133. See, e.g., THE PRESIDENTIAL/CONG. COMM'N ON RISK ASSESSMENT & RISK MGMT., *supra* note 129, at 3; SCIENCE AND DECISIONS, *supra* note 129, at 80–89.

134. For example, in *Coliseum Square Ass'n, Inc. v. Jackson*, 465 F.3d 215 (5th Cir. 2006), the Department of Housing and Urban Development ("HUD") had prepared an EA/FONSI on a redevelopment plan notwithstanding the possibility that the noise levels involved would exceed HUD's own guidelines. *Id.* at 228–30. The court supported HUD's decision on the grounds that its guidelines were not binding and that it could, therefore, utilize a different "methodology" for evaluating noise impacts to arrive at the summary conclusion that they would be minor. *Id.* At 229–30. This elides the distinction between the expected noise levels associated with the plan and the probabilities thereof. Some NEPA reviewing courts have taken care with the distinction. See, e.g., *Sierra Club v. Watkins*, 808 F. Supp. 852, 867–68

exercises.¹⁴⁶ As more is learned about possible consequences, more uncertainty begins to mark what we thought we knew.¹⁴⁷ Every ethical commitment to weighing consequences confronts this dilemma.¹⁴⁸ Decisions are always (eventually) due, though, leading to the all-too-common irony of analyses stuffed with data yet remarkably devoid of decisive knowledge.¹⁴⁹

Thus, the major choice in 1978 was to have agencies deal with uncertainty at NEPA's preliminary stages by rule. CEQ directed action agencies to create categories of actions normally requiring an EIS,¹⁵⁰ those normally *not* requiring an EIS,¹⁵¹ and any needed procedures to fit agency operations thereto.¹⁵² The latter category, known as a "categorical exclusion" ("CATX"), must provide for defaulting back to an EIS in the event that "extraordinary circumstances" are found.¹⁵³ The agencies that consistently produce the most EISs have made liberal use of CATXs.¹⁵⁴ Indeed,

146. Marjolein B.A. van Asselt & Ellen Vos, *The Precautionary Principle and the Uncertainty Paradox*, 9 J. RISK RES. 313, 316 (2006) ("New information can decrease, but also increase uncertainty as it may reveal the presence of uncertainties that were previously unknown or were underestimated. Advances in knowledge may illuminate that our understanding was more limited or the process more complex than thought before."); *see also* Veerle Heyvaert, *Governing Climate Change: Towards a New Paradigm for Risk Regulation*, 74 MOD. L. REV. 817 (2011).

147. *See, e.g.*, Ragnar E. Lofstedt, *Risk Versus Hazard—How to Regulate in the 21st Century*, 2 EUR. J. RISK REG. 149, 154–58 (2011) (reviewing the research into the toxicological properties of bisphenol A and finding that uncertainties which at first seemed minor eventually grew to undermine many of the certainties).

148. *See* SHELLY KAGAN, *NORMATIVE ETHICS* 64 (1998); James Lenman, *Consequentialism and Cluelessness*, 29 PHIL. & PUB. AFFS. 342 (2000). "The trouble for consequentialism . . . is that the foreseeable consequences of an action are so often a drop in the ocean of its actual consequences." *Id.* at 350.

149. *See* CALDWELL, *AGENDA*, *supra* note 89, at 85–96; Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Governmental Environmental Performance*, 102 COLUM. L. REV. 903, 918–22 (2002) (noting an incentive to action agencies to "overstuff" their EISs with whatever information about probable local consequences may be on hand).

150. *See* 40 C.F.R. §§ 1501.4(a)(1), 1507.3(b)(2)(i) (2015).

151. *Id.* §§ 1501.4(a)(2), 1507.3(b)(2)(ii).

152. *Id.* § 1507.3(a). As a rule, action agencies have done little to differentiate risk analysis's three principal dimensions.

153. *Id.* § 1501.4(a)(2). The "categorical exclusion" definition states that CATXs are a "category of action which do not individually or cumulatively have a significant effect" on the environment. *Id.* § 1508.4 (emphasis added). As more CATXs have been adopted, more legal challenges to the agencies' conclusions that their CATXs will not have a cumulatively significant impact have emerged. *See infra* note 311 and accompanying text.

154. Judging from CEQ data, a small handful of agencies—the Forest Service, Army Corps of Engineers, Department of Interior, and Federal Highway Administration—generate the vast majority of the (roughly 400-500) EISs finalized annually. Each has long maintained

the CATX has become the most common NEPA routine by far.¹⁵⁵ Between the two rule-guided limits, the regulations provide for a “rough cut, low budget” version of the EIS¹⁵⁶—the “environmental assessment” (“EA”)—where an agency is uncertain whether a CATX or EIS is more appropriate.¹⁵⁷ This is their principal tool for threshold uncertainty: the EA and, in the likely event an EA concludes in the negative, a “finding of no significant impact” (“FONSI”).¹⁵⁸ Otherwise, nothing in the regulations or CEQ guidance differentiates the facets of impact (risk) prediction or organizes the treatment of uncertainty in threshold determinations.

At its creation, this template was touted as a bi-partisan success,¹⁵⁹ chiefly in its aim at reducing “paperwork.”¹⁶⁰ After all, CATXs have almost no deliberative prerequisites.¹⁶¹ Compared to an EIS, EAs’ and FONSI’s alternatives analyses can be quite cursory.¹⁶² Noticing or engaging peers or the affected public regarding the threatened consequences weighed in either is almost entirely discretionary.¹⁶³

rules setting forth categories of actions where an EIS is normally required, where a CATX is presumptively appropriate, and where EA/FONSI’s are necessary.

155. See Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act, 75 Fed. Reg. 75,628, 75,632 (Dec. 6, 2010) (“Today, categorical exclusions are the most frequently employed method of complying with NEPA.”).

156. *River Road All., Inc. v. U.S. Army Corps of Eng’rs*, 764 F.2d 445, 449 (7th Cir. 1985).

157. 40 C.F.R. §§ 1501.4(b), 1508.9 (2015).

158. See *id.* § 1501.4(c), (e).

159. See, e.g., Nicholas C. Yost, *Streamlining NEPA—An Environmental Success Story*, 9 B.C. ENVTL. AFF. L. REV. 507, 507 (1981) (“In 1980 there were no legislative amendments to NEPA. NEPA was not targeted in the Heritage Foundation’s report. Nobody made any campaign promises to gut NEPA. NEPA is on nobody’s hit list.”)

160. See National Environmental Policy Act—Regulations, 43 Fed. Reg. 55,978, 55,979 (Nov. 29, 1978). The creation of NEPA’s preliminary routines were touted among the 1978 rules’ chief innovations. See *id.* at 55,979 (calling the regulations’ creation of the single “environmental assessment” as a preliminary NEPA routine one of the rulemaking’s “major innovations” and describing two measures adopted to reduce delays in the NEPA process and avoid EISs—the CATX and the FONSI).

161. See Colburn, *Administering NEPA*, *supra* note 80, at 10320 nn. 444–45.

162. See 40 C.F.R. § 1508.9(b) (2015) (requiring “brief discussions of . . . alternatives”). Some courts have linked the duty to weigh alternatives stated in NEPA section 102(2)(E) to the preparation of EAs/FONSI’s. See, e.g., *Highway J Citizens Grp. v. Mineta*, 349 F.3d 938, 960–61 (7th Cir. 2003). Regardless, the alternatives analysis in an EA is relaxed. See *id.*; see also *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 195 (D.C. Cir. 1991); *City of New York v. U.S. Dep’t of Transp.*, 715 F.2d 732, 744 (2d Cir. 1983).

163. See 40 C.F.R. § 1501.4(b) (2015) (requiring agencies to involve “agencies, applicants, and the public to the extent practicable” in the preparation of EAs); see also *Del. Dep’t of Nat. Res. & Envtl. Control v. U.S. Army Corps of Eng’rs*, 685 F.3d 259, 272–75 (3d

Of course replacing unwieldy decision procedures with rules can economize on time, information, and scarce cognitive resources.¹⁶⁴ However, rules also preempt updated study and deliberation;¹⁶⁵ often lead to over-confidence in questionable judgments;¹⁶⁶ and reinforce pre-existing biases¹⁶⁷ and dependencies.¹⁶⁸ The CEQ rules on FONSI are peculiar most of all in their demand for a “finding”—something NEPA’s authors are said to have rejected in favor of its “statement” ideal.¹⁶⁹ First, these findings will issue from agencies that often lack the requisite expertise.¹⁷⁰ Second, a

Cir. 2012) (noting that NEPA does not require agencies to seek comment on draft EA/FONSI documents as it does draft EISs); *Taxpayers of Mich. Against Casinos v. Norton*, 433 F.3d 852, 861 (D.C. Cir. 2006). *But see* *Brodsky v. U.S. Nuclear Reg. Comm’n*, 704 F.3d 113, 121–25 (2d Cir. 2013). In practice, comments from sibling agencies and other similarly expert participants who are *not* the personnel taking the subject action have been disproportionately effective in reversing agencies’ NEPA judgments. *See* Michael C. Blumm & Stephen R. Brown, *Pluralism and the Environment: The Role of Comment Agencies in NEPA Litigation*, 14 HARV. ENVTL. L. REV. 277, 306–07 (1990); Michael C. Blumm & Marla Nelson, *Pluralism and the Environment Revisited: The Role of Comment Agencies in NEPA Litigation*, 37 VT. L. REV. 5, 11–12 (2012) (discussing how agency comments critical of another agency’s decision can cause a court to proceed with heightened scrutiny).

164. *See* CARL CRANOR, *REGULATING TOXIC SUBSTANCES* 137–46 (1993); SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, *RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH* 20–28 (2003); David A. Super, *Against Flexibility*, 96 CORNELL L. REV. 1375, 1398–409 (2011); Wendy E. Wagner, *Administrative Law, Filter Failure, and Information Capture*, 59 DUKE L.J. 1321 (2010).

165. *See* EDLEY, *supra* note 26, at 66–69; *see also* DAVID LYONS, *FORMS AND LIMITS OF UTILITARIANISM* (1965) (critiquing various forms of “rule-utilitarianism”).

166. *See* JON ELSTER, *SECURITIES AGAINST MISRULE: JURIES, ASSEMBLIES, ELECTIONS* 84–97 (2013); *cf.* *Anderson v. Evans*, 314 F.3d 1006, 1023 (9th Cir. 2002) (observing that, unlike an EA/FONSI, preparation of an EIS “ensures that decision-makers know that there is a risk of significant environmental impact and take that impact into consideration”).

167. *See* Dan M. Kahan & Donald Braman, *Cultural Cognition and Public Policy*, 24 YALE L. & POL’Y REV. 149, 165 (2006) (“This phenomenon [biased assimilation] refers to the tendency of individuals to condition their acceptance of new information as reliable based on its conformity to their prior beliefs.”). Here, this new information is the acceptance of new law. *Id.*; *cf.* *Simmons v. U.S. Army Corps of Eng’rs*, 120 F.3d 664, 670 (7th Cir. 1997) (“If NEPA mandates anything, it mandates this: a federal agency cannot ram through a project before first weighing the pros and cons of the alternatives.”).

168. *See* *Greene Cty. Planning Bd. v. Fed. Power Comm’n*, 455 F.2d 412, 419–22 (2d Cir. 1972) (rejecting agency’s reliance on its applicant to inform its judgment and prepare a “detailed statement” only after judgment had been reached despite agency’s internal operating procedures to that effect).

169. *See* MANDELKER, *supra* note 89, § 2:3 (attributing to Senator Muskie the view that a “finding” would be more difficult to overturn in court and that the substitution of “statement” for findings was a necessary compromise for passage).

170. *Cf.* Wendy B. Davis & Rebecca Clarke, *Hot Air: Undue Judicial Deference to Federal Aviation Administration Expertise in Assessing the Environmental Impacts of Aviation*, 69 J. AIR L. & COM. 709 (2004) (describing FAA’s lack of expertise in assessing environmental impact);

such a finding?¹⁷⁷ Administrative findings are inextricably bound up with the character of the agency procedures yielding them and the judgments they inform.¹⁷⁸ The gravity of the potential consequences, the statutory delegation(s) empowering the agency, and the likely costs of searching for better information all weigh on an agency's issuance and use of findings.¹⁷⁹ Documenting the accumulated effects of all past "actions" is not necessarily something the average agency can fit into its NEPA budget.¹⁸⁰ Thus, perhaps unsurprisingly, FONSI's have prompted ambivalence from reviewing courts.¹⁸¹ The planning uncertainty caused by this ambivalence may diminish a FONSI's overall utility to action agencies.¹⁸² If so, CATXs and their substantiation seem to be on a similar path.¹⁸³ CEQ has lately counseled agencies that a CATX's

rather than EISs in recent years could exacerbate the cumulative effects problem." CONSIDERING CUMULATIVE EFFECTS, *supra* note 119, at v. 4. The manual made no mention of FONSI's, though.

177. If an agency, subject to NEPA, too often foregoes detailed statements, unduly constrains their scope, and/or erroneously dismisses possible consequences on their personnel's flawed intuition, it may reflect that agency's lack of expertise, lack of discretion, or both. *See, e.g.*, Matthew C. Stephenson, *Bureaucratic Decision Costs and Endogenous Agency Expertise*, 23 J.L. ECON. & ORG. 469, 471-73 (2007).

178. *See* EDLEY, *supra* note 26, at 48-71.

179. *See, e.g.*, *Universal Camera Corp. v. NLRB*, 340 U.S. 474 (1951).

180. *Cf.* *League of Wilderness Defs. v. Allen*, 615 F.3d 1122, 1135-37 (9th Cir. 2010) (adopting an "aggregate" approach to cumulative impact analysis as suggested by CEQ guidance). To make matters more vague, the rules nowhere *require* that "cumulative" or "indirect" impacts be weighed in the decision whether to prepare an EIS, nor that "reasonably foreseeable" effects inform whether to prepare an EIS as opposed to a CATX or FONSI. *See* *Edwardsen v. U.S. Dep't of Interior*, 268 F.3d 781, 786 (9th Cir. 2001).

181. *Compare* MANDELKER, *supra* note 89, § 8:49, § 8:49 n.1 (listing almost four dozen cases where FONSI's have been upheld), *with id.* § 8:50, § 8:50 nn.1-6 (listing thirty cases setting FONSI's aside as invalid).

182. Abbreviated procedures are only worthwhile if they are reliably brief, and the prevalence of remands in FONSI cases that are litigated may be altering that calculus. This is to deny neither that agency fact work normally garners deference from reviewing courts, *see* EDLEY, *supra* note 26, at 100, nor that the boundaries separating policy judgments and fact finding have been at their most permeable in cases involving risk analyses/regulation. *Id.* at 101-03. It is merely to observe that the judicial review of FONSI's and CATXs has become particularly fertile and unstable ground in arbitrariness review.

183. Agency "findings" of this sort are perhaps even more curious. For CATXs, CEQ's rules require that action agencies' procedures allow for "extraordinary circumstances in which a normally excluded action may have a significant environmental effect." 40 C.F.R. § 1508.4 (2015). The act of *creating* a CATX will itself be reviewable for arbitrariness. *See, e.g.*, *Sierra Club v. Bosworth*, 510 F.3d 1016, 1022-23 (9th Cir. 2007) (applying the arbitrary and capricious standard to the Forest Service's decision); *Colo. Wild v. U.S. Forest Serv.*, 435 F.3d 1204, 1213-15 (10th Cir. 2006) (applying the arbitrary and capricious standard to the Forest Service's decision); *Heartwood, Inc. v. U.S. Forest Serv.*, 230 F.3d 947 (7th Cir. 2000). The

“documentation” is key.¹⁸⁴ Whether in the form of a CATX or a FONSI, though, the literal text of CEQ’s rules on cumulative impact make any agency action involving greenhouse gases into a target for litigation.¹⁸⁵ And agencies of the federal government take a multitude of actions involving GHG emissions annually.

To sum up, how the “significance” threshold should work when an agency first judges section 102(2)(C)’s applicability has resisted clarification under the 1978 regime.¹⁸⁶ Nothing in CEQ’s rules spell out the preferred, correct, or necessary methods or procedures for agencies to employ before finding acceptable risks in a NEPA routine. And the rules provide no guidance on how to identify *all* NEPA-relevant factors, how CEQ’s factors are to be weighed against other legitimate factors, how decision-makers are to substantiate negative determinations, with whom they must consult in those determinations, or the scales—temporal or spatial—at which cumulative environmental risk should be managed.¹⁸⁷ In short, unlike many other statutes, NEPA has failed to keep pace with our attention to risk’s best treatments.

B. Risk Assessment in Judicial Doctrine

In any precedent, disentangling the treatment of risks’ facets from the treatment of the scope and standard of review can be

courts have consistently held that the creation of a CATX is not itself reviewable “action” under section 102(2)(C) of NEPA. *See, e.g., Wildlaw v. U.S. Forest Serv.*, 471 F. Supp. 2d 1221, 1242–43 (M.D. Ala. 2007). CEQ, however, maintains that NEPA *does* require action agencies to weigh potential cumulative effects of any CATX they establish. *See* Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act, 75 Fed. Reg. 75,628, 75,630 (Dec. 6, 2010).

184. *See* Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act, 75 Fed. Reg. at 75,636 (revising guidance on the establishment, application, documentation, and revision of CATXs and observing that the use of a CATX should often be followed up with a writing documenting the determination(s)); *see also* *Wilderness Watch v. Mainella*, 375 F.3d 1085, 1095 (11th Cir. 2004); *California v. Norton*, 311 F.3d 1162, 1176–77 (9th Cir. 2002); *Ctr. for Food Safety v. Johanns*, 451 F. Supp. 2d 1165, 1183–84 (D. Haw. 2006).

185. *See* Matthew P. Reinhart, *The National Environmental Policy Act: What Constitutes an Adequate Cumulative Environmental Impacts Analysis and Should It Require an Evaluation of Greenhouse Gas Emissions?*, 17 U. BALT. J. ENVTL. L. 145, 181–84 (2010); *see e.g.,* Mark Squillace & Alexander Hood, *NEPA, Climate Change, and Public Lands Decision Making*, 42 ENVTL. L. 469, 494–509 (2012).

186. *See* Aagaard, *supra* note 123, at 99–102 (describing four distinct lines of cases and finding “overall incoherence”).

187. *See supra* notes 91–96 and accompanying text.

complicated.¹⁸⁸ Factors from an agency's enabling legislation, disparate environmental threats, NEPA's required procedures, and agency procedures all merge at the courthouse steps, making granular analysis a challenge. Furthermore, most precedents treating issues of risk or uncertainty in NEPA rely on the APA, CEQ's regulations, or the action agency's regulations¹⁸⁹ as much or more than NEPA's text. Of course, regulations can be amended and no agency interprets the APA authoritatively.¹⁹⁰ However, there are at least three NEPA doctrines arguably grounded in *Chevron* step one holdings about NEPA and its treatment of risk or uncertainty.

The principal doctrine is that of *causation*, particularly the notion that for an "effect" to belong within the NEPA section 102(2)(C) calculus, that effect must bear some "reasonably close causal connection" to the proposed action.¹⁹¹ Regardless of whether the effects are dubbed "indirect," "cumulative," or something else,¹⁹² every "effect" is an effect of some cause or causes in our lexicon.¹⁹³ In *Metropolitan Edison Co. v. People Against Nuclear Energy*, the Supreme Court's construction of the section 102(2)(C) EIS's proper scope as excluding subjective *perceptions* of risk was its own, found nowhere in NEPA's text nor CEQ's regulations.¹⁹⁴

188. See, e.g., Jason J. Czarneski, *Revisiting the Tense Relationship Between the U.S. Supreme Court, Administrative Procedure, and the National Environmental Policy Act*, 25 STAN. ENVTL. L.J. 3 (2006).

189. See Colburn, *Administering NEPA*, *supra* note 80, at 10295–313.

190. See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 356–57 (1989).

191. The Supreme Court has held that "the terms 'environmental effect' and 'environmental impact' in § 102 [should] be read to include a requirement of a *reasonably close causal relationship* between a change in the physical environment and the effect at issue. This requirement is like the familiar doctrine of proximate cause from tort law." *Metro. Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774 (1983) (emphasis added) (citing WILLIAM PROSSER, *LAW OF TORTS* (4th ed. 1971)); see also *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 767 (2004) (quoting *Metro. Edison*).

192. See 40 C.F.R. § 1508.8(b) (2015) (defining "indirect" effects to include those effects caused by the action which are "later in time or farther removed in distance, but are still reasonably foreseeable"); *id.* § 1508.7 (defining "cumulative" impacts to include past, present, and reasonably foreseeable future impacts regardless of who caused them). Whatever else fits the description of "cumulative" effects, the separate definitions of "direct" and "indirect" effects suggest that cumulative effects signify something else. See *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 994 (9th Cir. 2004).

193. Although our legal tradition expects uniquely effective causes that are both necessary and sufficient for purposes of attributing consequences (and liabilities) thereto, life in a multi-causal, vaguely bounded world has long been recognized as uncooperative. See H.L.A. HART & TONY HONORÉ, *CAUSATION IN THE LAW* 9–25 (2d ed. 1985).

194. See *Metro. Edison*, 460 U.S. at 774–79.

Subsequent holdings have cemented this common law notion of covered effects/impacts into section 102(2)(C)'s reach both at its threshold and at the limits of a proper impact assessment.¹⁹⁵ In *Department of Transportation v. Public Citizen* the Court doubled down, holding that an agency without authority to govern some source of effects has no NEPA obligation to count those effects.¹⁹⁶ In short, causation excludes from NEPA section 102(2)(C) effects which are caused by another actor or actors.¹⁹⁷

This doctrine has kept “macro” risks off the NEPA landscape, or at least kept them subordinated.¹⁹⁸ Tort law’s struggle to achieve a risk-focused separation of threat from probability in conventional doctrines of responsibility¹⁹⁹ shows how disoriented priorities become when causation is a primary consideration.²⁰⁰ Without an explicit and authoritative differentiation of the expected impacts’ magnitude versus probability, reviewing courts are left to a mish-mash of theories on causation thresholds, their calculability, etc.²⁰¹

195. See, e.g., *N.J. Dep’t of Envtl. Prot. v. U.S. Nuclear Reg. Comm’n*, 561 F.3d 132, 137–43 (3d Cir. 2009) (asserting that NRC’s scope of its EIS does include the effects of a possible terrorist attack because NRC does control the airspace around Oyster Creek); *Sierra Club v. Marsh*, 976 F.2d 763, 767–68 (1st Cir. 1992); *No GWEN All. of Lane Cty., Inc. v. Aldridge*, 855 F.2d 1380, 1385–86 (9th Cir. 1988).

196. 541 U.S. 752, 770 (“We hold that where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant ‘cause’ of the effect.”).

197. See *City of Shoreacres v. Waterworth*, 420 F.3d 440, 452 (5th Cir. 2005) (“[I]t is doubtful that an environmental effect may be considered as proximately caused by the action of a particular federal regulator if that effect is directly caused by . . . another governmental entity over which the regulator has no control.”) (citing *U.S. Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752 (2004)).

198. See *Squillace & Hood*, *supra* note 185, at 522; *Wase*, *supra* note 131, at 976–85, 990–91.

199. See HART & HONORÉ, *supra* note 193, at 284–90; Glen O. Robinson, *Probabilistic Causation and Compensation for Tortious Risk*, 14 J. LEGAL STUD. 779 (1985).

200. Thus, in the many NEPA cases dwelling on ostensibly low-probability threats, e.g., terrorism, tsunamis, earthquakes, etc., a split exists between those that insist as a matter of law or prudence that some imaginable threat is too causally attenuated and those which convert the inquiry into a probabilistic weighing of the agency’s evidence. Compare *N.J. Dep’t Envtl. Prot.*, 561 F.3d at 137–44 (refusing to scrutinize agency’s causal attenuation conclusion), with *San Luis Obispo Mothers for Peace v. U.S. Nuclear Reg. Comm’n*, 449 F.3d 1016, 1029–32 (9th Cir. 2006) (holding that if the risk of a terrorist attack is not insignificant, then NEPA obligates the agency to take a “hard look’ at the environmental consequences of that risk”).

201. The most common judicial formulation is that risks which are “remote” and/or “speculative” need not factor into section 102(2)(C). See, e.g., *Sierra Club v. Marsh*, 976 F.2d 763, 768 (1st Cir. 1992); *Limerick Ecology Action, Inc. v. U.S. Nuclear Reg. Comm’n*, 869 F.2d 719, 745 (3d Cir. 1989); *Warm Springs Dam Task Force v. Gribble*, 621 F.2d 1017, 1026

Indeed, how climate change may or must factor into the average NEPA routine showcases the predisposition toward site-specific risks at the expense of attention to broader, more profound threats.²⁰²

A second set of precedents bears more directly on the treatment of uncertainty in NEPA. The Supreme Court has at least twice held that if an agency makes a considered choice to advance on a proposal where it does not know the possible environmental consequences, NEPA is no obstacle.²⁰³ Arbitrariness is something else, to be sure.²⁰⁴ Discretionary treatments of uncertainty have been judged “arbitrary” within the meaning of section 706(2) (A) if they are the product of faulty inference, false information, or prejudice.²⁰⁵ Many NEPA precedents involve as much.²⁰⁶ But lower courts must heed the Supreme Court’s repeated warnings against inventing procedural protocols in the teeth of permissive statutory

(9th Cir. 1980); *Carolina Env’tl. Study Grp. v. United States*, 510 F.2d 796, 799 (D.C. Cir. 1975). While the “speculative” prong may go to the quantum of evidence adduced for the subject threat, Aagaard, *supra* note 123, at 105 n.82, a risk can only be judged “remote” if some estimation of its probability has been made. *See, e.g., Sierra Club v. Watkins*, 808 F. Supp. 852, 867–68 (D.D.C. 1991). Otherwise, declaring a risk “remote” is clearly an error. *See Daniel Farber, Uncertainty*, 99 GEO. L.J. 901, 909–13 (2011).

202. *See Stein, supra* note 107, at 494–518 (reviewing constraints on climate change consideration in NEPA practice). Because of foreseeability’s links to *culpability*, *see HART & HONORÉ, supra* note 193, at 285–90, its use in NEPA has predictably focused attention on agency *fault* rather than overall social prudence. *See, e.g., Twp. of Lower Alloways Creek v. Pub. Serv. Elec. & Gas Co.*, 687 F.2d 732, 743–48 (3d Cir. 1982) (allocating to challenger the burden of proving a risk’s significance where the agency’s finding of insignificance had been made in a dated, generic EIS) (citing *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 553 (1978)). And because no single actor can be faulted for systemic hazards like global climate disruption, they can mostly be excluded from NEPA’s purview.

203. *See Vt. Yankee*, 435 U.S. at 552–56; *Balt. Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.* 462 U.S. 87, 97–108 (1983).

204. *See supra* notes 21–26 and accompanying text.

205. *See, e.g., Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43, 43–45 (1983); *Native Vill. of Point Hope v. Jewell*, 740 F.3d 489, 502–03 (9th Cir. 2014); *Ctr. for Bio. Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1198–1203 (9th Cir. 2008); *Nat. Res. Def. Council, Inc. v. U.S. Forest Serv.*, 421 F.3d 797, 813 (9th Cir. 2005); *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993–97 (9th Cir. 2004); *Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 731–36 (9th Cir. 2000); *Limerick Ecology*, 869 F.2d at 738–40; *cf.* 40 C.F.R. § 1500.1(b) (2015); *see also id.* § 1502.24 (“Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in [EISs].”).

206. *See, e.g., Meister v. U.S. Dep’t of Agric.*, 623 F.3d 363, 373 (6th Cir. 2010).

requires proactive inquiry targeting known or anticipated uncertainties,²¹⁵ with one exception, no governing precedent construing NEPA requires that uncertainty be managed in any particular fashion.

The exception is the Ninth Circuit's treatment of uncertainties arising at the section 102(2)(C) threshold and the allocation of proof burdens by and through a FONSI.²¹⁶ That court has held that NEPA *requires* that, whenever "substantial questions" arise about the nature or magnitude of a possible effect from the preparation or circulation of an EA, that agency must prepare an EIS and not a FONSI.²¹⁷ It has held further that an agency may not rely on the uncertainty of the effects of its actions as the *factual* grounds of a FONSI.²¹⁸ Although the 1978 regulations make factual uncertainty one factor in a "significance" finding,²¹⁹ Ninth Circuit precedent has made it a sufficient condition.²²⁰ District courts in the vast Ninth Circuit are bound by these holdings,²²¹ although that may be the extent of their reach.²²² Moreover, as

e.g., *Balt. Gas*, 462 U.S. at 105–06; *Ground Zero Ctr. for Non-violent Action v. U.S. Dep't of the Navy*, 383 F.3d 1082, 1089–91 (9th Cir. 2004).

215. *See, e.g.*, *Scientists' Inst. for Pub. Info., Inc. v. Atomic Energy Comm'n*, 481 F.2d 1079, 1092 (D.C. Cir. 1973); *Env'tl. Def. Fund, Inc. v. Froehlke*, 473 F.2d 346, 350–51 (8th Cir. 1972); *Hanly v. Kleindienst*, 471 F.2d 823, 835 (2d Cir. 1972); *Brooks v. Volpe*, 350 F. Supp. 269, 279 (W.D. Wash. 1972); *Env'tl. Def. Fund, Inc. v. Hardin*, 325 F. Supp. 1401, 1403 (D.D.C. 1971).

216. *See* Colburn, *Administering NEPA*, *supra* note 80, at 10316.

217. *See* *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 864–71 (9th Cir. 2005); *Anderson v. Evans*, 314 F.3d 1006, 1021 (9th Cir. 2002); *Idaho Sporting Cong. v. Thomas*, 137 F.3d 1146, 1149 (9th Cir. 1998); *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (9th Cir. 1992); *Sierra Club v. U.S. Forest Serv.*, 843 F.2d 1190, 1193 (9th Cir. 1988); *Found. for North Amer. Wild Sheep v. U.S. Dep't of Agric.*, 681 F.2d 1172, 1178 (9th Cir. 1982); *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1212 (9th Cir. 1998).

218. *See* *Ocean Advocates*, 402 F.3d at 870–71; *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 732 (9th Cir. 2001). In *Ocean Advocates*, the magnitude of increased vessel traffic from the dock project at issue was uncertain, 402 F.3d at 870, while in *Babbitt*, the efficacy of planned mitigation measures (for a "mitigated FONSI") was uncertain. *See Babbitt*, 241 F.3d at 731–36.

219. 40 C.F.R. § 1508.27(b)(5) (2015).

220. "Preparation of an EIS is mandated where uncertainty may be resolved by further collection of data or where the collection of such data may prevent 'speculation on potential . . . effects.'" *Nat'l Parks*, 241 F.3d at 731–32 (quoting *Sierra Club*, 843 F.2d at 1195).

221. *See* Evan H. Caminker, *Why Must Inferior Courts Obey Superior Court Precedents?*, 46 STAN. L. REV. 817, 823–25 (1994).

222. *Cf.* Caminker, *supra* note 221, at 873 (concluding that obedience to Supreme Court precedent is justified, and hierarchical obedience to circuit court precedent is also justified, albeit "somewhat more tentatively so"); *see, e.g.*, *Pogliani v. U.S. Army Corps of Eng'rs*, 306

Part V explains, the Supreme Court's continued campaign against court-fashioned procedural duties of any kind puts the Ninth Circuit's approach in doubt and highlights CEQ's opportunity where this more prophylactic treatment of NEPA uncertainty has emerged.

A final set of precedents grounded in NEPA's text, purpose, and history and, thus, not something the executive branch can simply interpret away, holds that NEPA's discretion belongs to the responsible official of the agency(ies) making the "proposal."²²³ These decisions arguably constrain the President or his delegate from prescribing analytical methods that displace discretionary judgment.²²⁴ However, by the terms of our *Chevron/Brand X* norms, they should not foreclose a presidential administration intent on guiding responsible officials in the exercise of their NEPA discretion. For judicial holdings *bind* agencies "administering" a statute only where and to the extent that (1) the statute can mean only what the court held it means;²²⁵ and (2) the agency's subsequent interpretation of the statute bears on the "precise" question adjudicated and is both unreasonable and contrary to that holding.²²⁶ The Supreme Court has so far done little to apply this

F.3d 1235, 1237 (2d Cir. 2002) (observing that NEPA "does not require an EIS to be issued" when an EA concludes that the effects of an action are uncertain).

223. See, e.g., *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 763 (2004) ("[T]he agency bears the primary responsibility to ensure that it complies with NEPA"); *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 378 (1989); *Calvert Cliffs' Coordinating Comm. v. Atomic Energy Comm'n*, 449 F.2d 1109, 1115 (D.C. Cir. 1971).

224. Congress has shown itself capable of empowering the President in terms when it wants to do so. See Elena Kagan, *Presidential Administration*, 114 HARV. L. REV. 2245, 2326–31 (2001). And scholarly opinion differs over the relevance of statutory silence regarding the President. Compare Kevin M. Stack, *The President's Statutory Powers to Administer the Laws*, 106 COLUM. L. REV. 263, 315 (2006) (proposing a rebuttable presumption that executive orders are binding on agency actors even without express statutory authorization), with Peter L. Strauss, *Overseer, or "The Decider"? The President in Administrative Law*, 75 GEO. WASH. L. REV. 696, 712–13 (2007) (distinguishing between a President's legal and political authorities and arguing that his/her legal authority only extends to overseeing decisions which are not delegated to the President in terms). In the case of section 102(2)(C), the choice to name "all agencies of the Federal Government" and not the President as the responsible party was neither casual nor accidental; it was innately apiece with the legislative purpose. See Colburn, *Administering NEPA*, *supra* note 80, at 10299–301.

225. *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 982–83 (2005); see Note, *Implementing Brand X: What Counts as a Step One Holding?*, 119 HARV. L. REV. 1532, 1538 (2006).

226. Cf. *Brand X*, 545 U.S. at 982 ("*Chevron's* premise is that it is for agencies, not courts, to fill statutory gaps.").

worst things first: an imperative that follows from the first prerequisites while entailing its own challenges. Additionally, it would build in some means of continuous improvement to reflect our constantly evolving knowledge of different risks. An executive order consistent with the President's constitutional authority and duty under Article II and NEPA would direct action agencies to devise their *own* means for pursuing these three imperatives across the range of NEPA issues raised in Part III and, for purposes of their accountability to the President and the American people, to explain and justify those choices. Section A develops this outline and Section B fits the proposal to the President's constitutional authority and duty to guide and supervise those who execute the law. Part V will trace the legal principles that must inform any White House effort to these ends.

A. Quantifying Risk and Focusing on the Worst First: Substantive NEPA's Future

For most of NEPA's history the United States has been evolving toward a more express, more intentional focus on the governance of risk.²³⁴ However, NEPA *as law* has mostly ignored what probabilism brings to thinking about possible futures.²³⁵ As an earlier dichotomy of risk versus uncertainty²³⁶ has given way to a

234. See BECK, RISK SOCIETY, *supra* note 13, at 19–50; BRYAN G. NORTON, SUSTAINABILITY: A PHILOSOPHY OF ADAPTIVE ECOSYSTEM MANAGEMENT 2–17 (2005); SHAPIRO & GLICKSMAN, *supra* note 164; William Boyd, *Genealogies of Risk: Searching for Safety, 1930-1970s*, 39 ECOLOGY L.Q. 895, 948–78 (2012) (“In fact, during much of the 1970s, there were multiple efforts across the burgeoning fields of health, safety, and environmental law to adapt earlier precautionary impulses to the new world of environmental harm that had become visible.”).

235. See, e.g., *Sierra Club v. Watkins*, 808 F. Supp. 852, 867–68 (D.D.C. 1991) (“The argument between the Sierra Club and the Department over the risk estimates is an argument about *probabilities* and should be expressed in the EA as such; the Department cannot simply eliminate those risks or avoid discussing their potential effects.”); *City of New York v. U.S. Dep’t of Transp.*, 715 F.2d 732, 746 (2d Cir. 1983) (“It is only the risk of accident that might render the proposed action environmentally significant. That circumstance obliges the agency to undertake risk assessment: an estimate of both the consequences that might occur and the probability of their occurrence.”).

236. The origins of the distinction are unclear, but economists Frank Knight and J.M. Keynes share much of the credit. See FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT 224–32 (1921); JOHN MAYNARD KEYNES, A TREATISE ON PROBABILITY (1921); see also JONATHAN BARON, THINKING AND DECIDING 281–82 (4th ed. 2008); ROGER M. COOKE, EXPERTS IN UNCERTAINTY: OPINION AND SUBJECTIVE PROBABILITY IN SCIENCE 18 (1991) (“The most important tool in rationally incorporating expert opinion in science is the representation of uncertainty.”). Both Knight and Keynes understood uncertainty within their own “expected utility theory.” BARON, *supra*, at 233–43.

arbitrarily.²⁵⁷ Indeed, discounting improbable or minor threats to zero is often a practical impossibility for public agencies.²⁵⁸ Yet these threats have sometimes led to immensely technical and burdensome analyses.²⁵⁹ If these analyses drive NEPA routines, they risk shutting out the inexpert—the one result judicial doctrine *does* reject.²⁶⁰ “Characterizing uncertainty analytically puts risk analysts on the horns of a dilemma: simple characterizations are likely to give an erroneous impression of the extent of uncertainty, but more careful and elaborate characterizations may be incomprehensible to nonspecialists and so unusable by decision makers.”²⁶¹ The more numerous the uncertain threats, the more serious this challenge.²⁶² In this light, good judgments become as much the product of sustained cross-disciplinary collaboration and

257. FRANK, *supra* note 241, at 222–23. All statistical methods have unavoidably subjective elements. See Berger & Berry, *supra* note 254, at 165. Properly *subjectivist* methods, however, yield *belief*-type expressions of probability as opposed to *frequency*-type expressions. Cf. IAN HACKING, THE EMERGENCE OF PROBABILITY 11, 16 (1975) (observing that the modern concept of probability has always been “Janus-faced” with one side “statistical, concerning itself with stochastic laws of chance processes” and the other side “epistemological, dedicated to assessing reasonable degrees of belief in propositions quite devoid of statistical background”); IAN HACKING, AN INTRODUCTION TO PROBABILITY AND INDUCTIVE LOGIC 127–39 (2001) (observing that two different kinds of probability, one aleatory and the other evidential or doxastic, figure equally into modern usage). Belief-type expressions that are not explained as such can weaken a community of inquirers they inform. “[F]rom an individualistic perspective, there is no non-arbitrary way to determine a correct level of reliability that applies across a whole range of investigations.” Torsten Wilholt, *Epistemic Trust in Science*, 64 BRIT. J. PHIL. SCI. 233, 236 (2013). This means that, without careful disclosure, inquirers must guess at the relative reliability of each other’s work. See *id.*; see also Torsten Wilholt, *Bias and Values in Scientific Research*, 40 STUD. HIST. & PHIL. SCI. 92 (2008). Any inquiry that is cumulative will be made collectively worse off. *Id.*

258. See, e.g., *San Luis Obispo Mothers for Peace v. U.S. Nuclear Reg. Comm’n*, 789 F.2d 26, 39–40 (D.C. Cir. 1986). Even viewing agency decision makers as a well-ordered deliberating group leads to the dilemmas of size, including the emergence of “rational ignorance” (free riding) and the often diminishing returns of costly investigation. See ELSTER, *supra* note 166, at 153.

259. See, e.g., Adelman, *supra* note 65, at 541–58 (discussing methods of statistical analysis within environmental policy-making); Farber, *supra* note 201, at 936–40; Boyd, *supra* note 234, at 981–83; Eric Biber, *Which Science? Whose Science? How Scientific Disciplines Can Shape Environmental Law*, 79 U. CHI. L. REV. 471, 485–87 (2012).

260. See *infra* note 314 and accompanying text.

261. UNDERSTANDING RISK, *supra* note 129, at 67; see also Lynn J. Frewer et al., *The Views of Scientific Experts on How the Public Conceptualize Uncertainty*, 6 J. RISK RES. 75 (2003).

262. Different sources of threat demand different experts and their expressions of (their) uncertainty. Thus, for example, besides the uncertainty of future climate sensitivities, the uncertain socioeconomic consequences of disruption must be factored into any projections of future losses. See Geoffrey Heal & Antony Millner, *Uncertainty and Decision Making in Climate Change Economics*, 8 REV. ENVTL. ECON. & POL’Y 120 (2014).

trustworthy communication as anything else.²⁶³ But there can be no meaningful risk judgment from ignorance. Predictions addled with uncertainties which are never surfaced are at least communicatively (and perhaps more deeply) flawed.²⁶⁴

NEPA's second worst failing has been its undue attention to site-specific risks at the expense of broader-scaled—if also less manageable—systemic threats.²⁶⁵ Continued neglect of these 'macro risks' to which agency actions contribute in concert with others over long(er) intervals is in keeping neither with NEPA's purposes nor its texts.²⁶⁶ NEPA calls for the integration of its own

263. Cf. ELSTER, *supra* note 166, at 36–68 (arguing that good collective decision making must navigate between the excesses and weaknesses of bargaining, deliberating, and voting); PHILIP KITCHER, *THE ADVANCEMENT OF SCIENCE* (1993); SCIENCE AND DECISIONS, *supra* note 129, at 260–61; John Hardwig, *The Role of Trust in Knowledge*, 88 J. PHIL. 693 (1991) (arguing that science and scientists are just as dependent on trust and the reliability of other scientists' character as anyone in claiming to know or have justified beliefs); Andreas Klinke & Ortwin Renn, *Adaptive and Integrative Governance on Risk and Uncertainty*, 15 J. RISK RES. 273, 280–81 (2012) (observing that risk estimation is necessarily inter-disciplinary and that it thus must rely on careful communications).

264. See SCIENCE AND DECISIONS, *supra* note 129, at 263–65; see also *New York v. U.S. Nuclear Reg. Comm'n*, 681 F.3d 471, 476–79 (D.C. Cir. 2012); *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1220–23 (5th Cir. 1991); *Limerick Ecology Action, Inc. v. U.S. Nuclear Reg. Comm'n*, 869 F.2d 719, 736–42 (3d Cir. 1989); *Sierra Club v. U.S. Nuclear Reg. Comm'n*, 862 F.2d 222, 223–29 (9th Cir. 1988); *San Luis Obispo Mothers for Peace v. U.S. Nuclear Reg. Comm'n*, 799 F.2d 1268, 1270–71 (9th Cir. 1986); *Carolina Acad. Study Grp. v. U.S. Atomic Energy Comm'n*, 510 F.2d 796, 799–800 (D.C. Cir. 1975). Where early "rule of reason" precedents may have ignored this foundation, see, e.g., *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283–84 (9th Cir. 1974); *Citizens for Safe Power v. U.S. Nuclear Reg. Comm'n*, 524 F.2d 1291, 1299–1300 (D.C. Cir. 1975); *Sierra Club v. Morton*, 510 F.2d 813, 819–29 (5th Cir. 1975), later precedents are keyed directly to it. See, e.g., *Found. on Econ. Trends v. Heckler*, 756 F.2d 143 (D.C. Cir. 1985); *Fritiofson v. Alexander*, 772 F.2d 1225, 1231–39 (5th Cir. 1985).

265. See *City of Los Angeles v. Nat'l Highway Traffic Safety Admin.*, 912 F.2d 478, 501 (D.C. Cir. 1990) (Wald, J., dissenting); CALDWELL, *AGENDA*, *supra* note 89, at 85–96; Karkkainen, *supra* note 149, at 918–22 (noting an incentive to action agencies to "overstuff" their EISs with whatever information about probable local consequences may be on hand); Lee H. MacDonald, *Evaluating and Managing Cumulative Effects: Process and Constraints*, 26 ENVTL. MGMT. 299 (2000).

266. Cf. Beth C. Bryant, *NEPA Compliance in Fisheries Management: The Programmatic Supplemental Environmental Impact Statement on Alaskan Groundfish Fisheries and Implications for NEPA Reform*, 30 HARV. ENVTL. L. REV. 441, 455–78 (2006) (describing lack of programmatic analyses in federal marine fisheries management and a case study where a programmatic EIS was prepared); Richard A. Forrest, *Yucca Mountain is Dead: The Challenge of Nuclear Waste Governance in the United States*, in *NUCLEAR WASTE GOVERNANCE: AN INTERNATIONAL COMPARISON* 265 (2015) (describing a build-up of high level nuclear waste and U.S. failure to assess this outcome as a whole in licensing civilian nuclear reactors); Jennifer Hoffpauir, *The Environmental Impact of Commodity Subsidies: NEPA and the Farm Bill*, 20 FORDHAM ENVTL. L. REV. 233 (2009) (describing a continuing failure by the Farm Service Agency to prepare

“essential considerations of national policy”²⁶⁷ with the obliging imperatives guiding agencies individually.²⁶⁸ Here, again, prediction looks to probability. However, good cumulative impact and aggregate, programmatic analyses stem from careful *retrospective* study.²⁶⁹ Agencies, although capable, lack the incentive to do that on their own.²⁷⁰ It may be information costs,²⁷¹ political

an EIS in connection with its subsidization of industrial-scale commodity agriculture); Light, *supra* note 131, at 544–51 (finding substantial variation in agencies incorporating global warming into NEPA routines but that none had made it decisive in any NEPA document); Hannah Torres et al., *Whither the U.S. National Ocean Policy Implementation Plan?*, 53 MARINE POL'Y 198 (2015) (finding that piecemeal governance of threats to marine fisheries has ignored systemic and synergistic problems like nutrient pollution, overfishing, and habitat destruction).

267. 42 U.S.C. § 4331(b) (2012).

268. NEPA section 101(a) declares it the federal government's “continuing policy” of managing the natural world so as to “fulfill the social, economic, and other requirements of present and future generations of Americans.” 42 U.S.C. § 4331(a) (2012). Likewise, section 102(2)(b) directs agencies to “develop methods and procedures, in consultation with [CEQ] . . . [to] insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking” *Id.* § 4332(2)(b). Together, these provisions affirm the statute's *substantive* side still to be “faithfully executed,” U.S. CONST. art. II, § 3, a condition the President is obliged to remedy. See Colburn, *Administering NEPA*, *supra* note 80, at 10296–301.

269. See CONSIDERING CUMULATIVE EFFECTS, *supra* note 119, at 12; Lance N. McCold & James W. Saulsbury, *Including Past and Present Impacts in Cumulative Impact Assessments*, 20 ENVTL. MGMT. 767 (1996); cf. EPA, CONSIDERATION OF CUMULATIVE IMPACTS IN EPA REVIEW OF NEPA DOCUMENTS 18 (1999), <http://www.epa.gov/sites/production/files/2014-08/documents/cumulative.pdf> [<https://perma.cc/7KPP-GZ47>] (“Since cumulative impacts often occur at the landscape or regional level, thresholds should be developed at similar scales”); MacDonald, *supra* note 265, at 305 (“The first step is to understand the basic processes that drive the system of interest.”). For those environmental risks that defy quantification, various methods exist for studying and comparing them qualitatively. See, e.g., Thomas K. Rudel, *Meta-Analyses of Case Studies: A Method for Studying Regional and Global Environmental Change*, 18 GLOBAL ENVTL. CHANGE 18 (2008).

270. Executive Order 13563's section 6 directs covered agencies to perform retrospective analyses of their major rules' actual—as opposed to predicted—costs and benefits. Exec. Order 13563—Improving Regulation and Regulatory Review, 76 Fed. Reg. 3821, 3822 (Jan. 18, 2011). Executive Order 13610 structures the process and schedules of these retrospective reviews. See Exec. Order 13610—Identifying and Reducing Regulatory Burdens, 77 Fed. Reg. 28,469 (May 10, 2012). Practice has shown that retrospective analyses have been more accurate—if also harder to prompt. See Winston Harrington et al., *On the Accuracy of Regulatory Cost Estimates*, 19 J. POL'Y ANALYSIS & MGMT. 297 (2000); Thomas O. McGarity & Ruth Ruttenberg, *Counting the Cost of Health, Safety, and Environmental Regulation*, 80 TEX. L. REV. 1997 (2002).

271. See Karkkainen, *supra* note 149, at 911–25 (2002) (noting NEPA's authors' belief that its information disclosures would feed a populist “Jeffersonian” impulse and finding that, in practice, NEPA's typical EIS is very limited in scope owing to the costs of acquiring good information).

costs,²⁷² or a managerial necessity to keep operations relatively compartmentalized.²⁷³ Guiding NEPA agencies toward a risk-focused approach would require more retrospective study of their choices.²⁷⁴ If anything, it has long been clear that agencies fuddy their predictions to maximize the chances they will not be proven wrong.²⁷⁵ Retrospective study could correct for some of these tendencies.

Thus, what the President could do pursuant to Article II, Section 3 and NEPA is order (1) that agencies commit to separating their consequences and probability estimates; (2) that they provide at least a qualitative analysis of the uncertainties in each; (3) that they periodically study how these predictions have panned out over time and in retrospect, and (4) that they do so with respect to *all* their NEPA “significance” determinations—positive, negative, preliminary and plenary. An executive order directing all agencies to take such an approach would be justified by NEPA and the growing planning uncertainty within our “precarious equilibrium” described in Part III. Section B links this agenda to the legal foundations underlying NEPA, the presidency, and CEQ.

272. See CALDWELL, AGENDA, *supra* note 89, at 50–58, 64–70; cf. ARCHON FUNG ET AL., FULL DISCLOSURE: THE PERILS AND PROMISE OF TRANSPARENCY 24–34 (2007) (describing many potent roles disclosures play in politics and markets).

273. Most federal agencies are organized into divisions and units serving discrete functions, making them more amenable to outsourcing than to achieving the sort of integration NEPA’s creators envisioned. Compare John D. Donahue, *The Transformation of Government Work*, in GOVERNMENT BY CONTRACT: OUTSOURCING AND AMERICAN DEMOCRACY 41, 43–47 (Jody Freeman & Martha Minow eds., 2009) (describing an increasingly specialized government and the rise of “commodity tasks” that are made modular in order to be readily re-delegated), with CALDWELL, AGENDA, *supra* note 89, at 73–75 (describing sentiments in Congress in the late 1960s and early ‘70s that more integration of governance was the key to halting environmental loss and degradation).

274. Cf. Final Guidance for Federal Departments and Agencies on Establishing, Applying, and Revising Categorical Exclusions Under the National Environmental Policy Act, 75 Fed. Reg. 75,628, 75,633 (Dec. 6, 2010) (recommending that agencies “obtain useful substantiating information by monitoring and/or otherwise evaluating the effects of implemented actions that were analyzed in EAs that consistently supported [FONSIs]”).

275. See Paul J. Culhane, *The Precision and Accuracy of U.S. Environmental Impact Statements*, 8 ENVTL. MONITORING & ASSESSMENT 217, 217 (1987) (retrospective study finding low prevalence of inaccurate predictions and unanticipated effects and attributing it to the fact that predictions were vague and mostly directional as opposed to quantified and precise).

B. Ordering Responsible Officials to 'Faithfully Execute' All of NEPA

A critical point is how the statute's litigation-driven legacy has diverged from its text and purpose. The statute's clear language puts the onus on *all agencies* to take "an interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on [the] environment"²⁷⁶ and to "identify and develop methods and procedures, in consultation with [CEQ] which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations."²⁷⁷ Finally, independent of any "detailed statement" prepared in accordance with section 102(2)(C), agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."²⁷⁸ If these three mandates are to be implemented in keeping with NEPA's structure and purpose, it will come from a President's order that the whole of the law be faithfully executed.²⁷⁹ This will entail agencies' retrospective analyses of their own programs' traceable consequences in the "human environment," those agencies' careful coordination with other contributors to the same problems, and their joint development of acceptable quantitative methods. Presidents have lately prompted coordinated executive action in precisely this fashion.²⁸⁰

However, the President is in no position to dictate acceptability thresholds for all the many risks that NEPA agencies encounter.

276. 42 U.S.C. § 4332(2)(A) (2012); *see also id.* § 4332(2)(F) (requiring that agencies "recognize the worldwide and long-range character of environmental problems").

277. *Id.* § 4332(2)(B).

278. *Id.* § 4332(2)(E).

279. *See* *Free Enter. Fund v. Pub. Co. Accounting & Oversight Bd.*, 561 U.S. 477, 504–07 (2010) (holding the President is empowered to ensure the execution of all the laws and invalidating a removal from office protection to preserve the President's prerogatives); *Dames & Moore v. Regan*, 453 U.S. 654, 678 (1981) (recognizing the President's duty and power to supervise those executing the law under Article II, Section 3).

280. *See* *Developments in the Law—Presidential Authority*, 125 HARV. L. REV. 2057, 2072–89 (2012); Jodi Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 HARV. L. REV. 1131, 1155–81 (2012); Kagan, *supra* note 224, at 2299–303; Peter L. Strauss, *Presidential Rulemaking*, 72 CHI.-KENT L. REV. 965, 971–79 (1997).

NEPA's very structure belies that approach²⁸¹ as do the practical realities of our executive branch.²⁸² Arbitrariness review may have matured in step with our society's evolving stance toward risk governance, but it has never neatly separated rational from arbitrary predictive methods. Nor will it given rational inquiry's propensity to evolve and expand and judicial review's reactive posture. Nonetheless, the President could order CEQ to help guide agencies through a tangle of judicial doctrine and overlapping delegations to focus their attention on the worst things first. Scores of decisions confront the dismissal of threats as "remote" or "speculative" on uncertain grounds. Such judgments invite the inference that "facts" separate them from bias²⁸³ (especially where some "finding" arises²⁸⁴), even as they defy any ordering.²⁸⁵ Because the questions as they arise in judicial review have been whether some threat is *sufficiently* "remote,"²⁸⁶ some

281. See *supra* notes 72–79 and accompanying text; Colburn, *Administering NEPA*, *supra* note 80, at 10301–04.

282. See Freeman & Rossi, *supra* note 280, at 1153 (finding that Presidents cannot accomplish large-scale coordination or consolidations without congressional support); Compare Kagan, *supra* note 224, at 2298–99 (arguing that given the realities of principal/agent issues, scale and scope of the executive branch, and timing, the President's control of administrative actors often stems more from persuasion and compromise than from "directive authority"), with Stack, *supra* note 224, at 322 ("Congress's enduring practice of enacting delegations to executive officials under express conditions of presidential approval supports a negative implication that delegations to executive officials alone do not grant the President directive powers.").

283. Cf. *Ethyl Corp. v. EPA*, 541 F.2d 1, 28 (D.C. Cir. 1976) (concluding that evidence of "endangerment" need not be conclusive nor even "more likely than not" to prove an actionable threat, but that it must be something substantial if agency action is to be motivated thereby).

284. See JAFFE, *supra* note 17, at 595 ("A finding of fact which is based on no more than the will or desire of the administrator is lawless in substance if not in form."); RICHARD J. PIERCE, JR. ET AL., *ADMINISTRATIVE LAW AND PROCESS* 128 (5th ed. 2009) ("When agencies take actions based on inaccurate factual predicates, they depart from legislative policy just as much as when their actions are based on erroneous interpretations of statutory provisions.").

285. Thus, the most celebrated NEPA precedent on greenhouse gas abatements and "cumulative impact," *Ctr. for Bio. Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172 (9th Cir. 2008), is arguably *sui generis* given the volume of emissions at issue, *id.* at 1189–90, the Ninth Circuit's unique "substantial questions" doctrine, *id.* at 1221, and the agency's decision to quantify the *harms* of reducing emissions without even attempting to quantify the benefits thereof. *Id.* at 1200. And the Ninth Circuit itself remains divided over what analytical burdens it may rightly put upon NEPA agencies. See *Lands Council v. McNair*, 537 F.3d 981, 1000–03 (9th Cir. 2008) (discussing past NEPA cases heard by the court and law applied), *abrogated on other grounds by* *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7 (2008).

286. Cf. *Carolina Env'tl. Study Grp. v. United States*, 510 F.2d 796, 799–800 (D.C. Cir. 1975).

agency's policies or programs have been *cumulatively* significant,²⁸⁷ and future contributions are *sufficiently* unpredictable,²⁸⁸ cynicism will keep insinuating that extraneous factors are afoot.²⁸⁹ Yo-yoing between deferential and searching reviews of predictive methods, inferences from inconclusive evidence, and/or multi-factor decisions is neither NEPA's best future²⁹⁰ nor a President's.²⁹¹

If a complete EIS must treat "[all] reasonably foreseeable significant adverse effects on the human environment"²⁹² and such effects can be direct,²⁹³ indirect,²⁹⁴ or "cumulative" in nature,²⁹⁵ there is nothing necessarily confining that inquiry to what the agency itself causes *per se*.²⁹⁶ CEQ has long maintained that "[s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment"²⁹⁷ after aggregating the

287. *Cf.* League of Wilderness Defs. v. U.S. Forest Serv., 549 F.3d 1211, 1216–19 (9th Cir. 2008) (citing CEQ guidance allowing agency to aggregate past actions into an environmental "baseline" for purposes of cumulative impacts analysis).

288. *Cf.* Suffolk Cty. v. Sec'y of the Interior, 562 F.2d 1368, 1373–78 (2d Cir. 1977) (rejecting plaintiffs' argument that EIS inadequately explored possible future development scenarios on the grounds that market conditions three years in the future were unpredictable).

289. *Cf.* Aagaard, *supra* note 123, at 95–102 (analyzing precedents and finding little coherence); Mattix & Becker, *supra* note 92, at 1136–42 (same); Stephenson, *supra* note 177, at 484 ("Empirical evidence on judicial decision making, though hardly conclusive, generally supports the view that judges practice 'selective deference' in applying the hard look standard.").

290. *Cf.* San Luis Obispo Mothers for Peace v. U.S. Nuclear Reg. Comm'n, 449 F.3d 1016, 1028–32 (9th Cir. 2006) (holding that because the agency had failed to prove that risk of terrorism was unquantifiable it could not discount the risk to zero for NEPA purposes); Nat'l Parks & Conservation Ass'n v. Babbitt, 241 F.3d 722, 731–36 (9th Cir. 2001) (requiring the agency to conduct studies proving vessels will not significantly affect bay ecosystem before permitting vessels into the bay based on conclusion that the effects are not likely to be significant); Sierra Club v. Watkins, 808 F. Supp. 852, 869 (D.D.C. 1991) (holding that because the agency "cannot deny that [highly improbable] accidents are possible," an EIS discussing each of the risks was required).

291. *Cf.* Stack, *supra* note 224, at 315–16 (observing that it is extraordinarily difficult to determine whether presidential politics or other, better reasons motivate agency decisions once a policy choice becomes politicized and that administrations often lose credibility in the process).

292. See 40 C.F.R. § 1502.22 (2015).

293. See MANDELKER, *supra* note 89, § 10:33.

294. See MANDELKER, *supra* note 89, § 10:41.

295. 40 C.F.R. § 1502.22(b); see MANDELKER, *supra* note 89, § 10:42; Daniel R. Mandelker, *Growth-Induced Land Development Caused by Highway and Other Projects as an Indirect Effect Under NEPA*, 43 ENVTL. L. REP. 11068, 11068 (2013) [hereinafter Mandelker, *Growth-Induced Land Development*].

296. See *supra* notes 198–202 and accompanying text.

297. 40 C.F.R. § 1508.27(b)(7) (2015).

proposal with other “related”²⁹⁸ “past, present and reasonably foreseeable *future actions*”—regardless of who takes them.²⁹⁹ While these rules aimed to broaden NEPA’s temporal and spatial scales, action agencies have resisted in the scoping of their NEPA routines. Whether a reviewing court seizes on an agency’s failure to disaggregate past actions and their traceable environmental effects,³⁰⁰ the probability that some project/decision will enable or attract economic growth and thus “cause” that environmental damage,³⁰¹ or upon probable but as-yet-unscheduled future actions being ignored,³⁰² the scope of CEQ’s *aggregate* significance has remained obscure.³⁰³ Indeed, by some plausible interpretations the significance threshold itself would be swallowed if CEQ’s aggregative provisos were applied strictly.³⁰⁴ Ultimately, if causality

298. *Id.*

299. 40 C.F.R. § 1508.7 (2015) (emphasis added).

300. *See, e.g.*, *Ctr. for Bio. Diversity v. Nat’l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1215–16 (9th Cir. 2008); *Lands Council v. Powell*, 395 F.3d 1019, 1027–28 (9th Cir. 2005); *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 993–97 (9th Cir. 2004).

301. *See Barnes v. U.S. Dep’t of Transp.*, 655 F.3d 1124, 1136–39 (9th Cir. 2011); *O’Reilly v. U.S. Army Corps of Eng’rs*, 477 F.3d 225, 234–37 (5th Cir. 2007); *City of Davis v. Coleman*, 521 F.2d 661, 674–76 (9th Cir. 1975); *Davis v. Mineta*, 302 F.3d 1104, 1122–23 (10th Cir. 2002).

302. *See, e.g.*, *S. Fork Band Council of W. Shoshone of Nev. v. U.S. Dep’t of Interior*, 588 F.3d 718, 725–28 (9th Cir. 2009); *Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 895–97 (9th Cir. 2002).

303. Courts reviewing threshold determinations have often conflated versions of “cumulative effects” as those “greater than the sum of their parts” or “synergistic,” *see, e.g.*, *Ctr. for Bio. Diversity*, 538 F.3d at 1215, and versions that seek to link nominally discrete but functionally continuous activities to the same consequences or effects. *See, e.g.*, *Native Ecosystems Council v. Dombeck*, 304 F.3d 886, 893–97 (9th Cir. 2002); *Airport Neighbors All. v. United States*, 90 F.3d 426, 430 (9th Cir. 1996) (upholding EA/FONSI that excluded reasonably foreseeable future actions from cumulative effects analysis because they were not “so interdependent that it would be unwise or irrational to complete one without the others.”) (quoting *Park Cty. Res. Council v. U.S. Dep’t of Agric.*, 817 F.2d 609, 623 (10th Cir. 1987)); *LaFlamme v. Fed. Energy Reg. Comm’n*, 852 F.2d 389, 401–02 (9th Cir. 1988) (linking FERC’s separate dam licensings on the same watershed together and finding the refusal to prepare an EIS analyzing their cumulative impacts together unreasonable). Some courts, along with CEQ’s hastily drafted informal memo of 2005, allow agencies to lump all past actions together in constituting a baseline. *See, e.g.*, *League of Wilderness Defs. v. U.S. Forest Serv.*, 549 F.3d 1211, 1216–18 (9th Cir. 2008). *But see, e.g.*, *Grand Canyon Trust v. FAA*, 290 F.3d 339, 345 (D.C. Cir. 2002) (finding such analysis insufficient to establish a baseline).

304. *See* Jamison E. Colburn, *Addition by Subtraction: NEPA Routines as Means to More Systemic Ends*, in *THE LAWS OF NATURE: REFLECTIONS ON THE EVOLUTION OF ECOSYSTEM MANAGEMENT LAW & POLICY* 145, 147–55 (Kalyani Robbins ed., 2013).

and responsibility are more perspective than fact,³⁰⁵ there is no reason to expect courts to clarify them.

Perhaps more troubling, though, is that skewed effects analyses carry directly into alternatives analyses. If an agency convinces itself that its actions are of little consequence, it will skew the alternatives considered and conventional estimative techniques can easily do so.³⁰⁶ Presidents have every right and reason to spur their personnel to think bigger collectively.³⁰⁷ If cumulative impacts are evident only as the spatial and temporal scales widen³⁰⁸ and “baselines” are pushed back, that analysis will sweep in the contributions of other actors and agencies.³⁰⁹ For land managing

305. Modern epidemiology well illustrates the substance of causation in perspective. See Kenneth J. Rothman & Sander Greenland, *Causation and Causal Inference in Epidemiology*, 95 AMER. J. PUB. HEALTH S144, S145 (2005) (showing that any given disease can be traced to more than one causal mechanism and every causal mechanism involves the joint action of a multitude of component causes, rendering some causes that are virtually certain at one scale highly uncertain at others); Kenneth J. Rothman, *Causes*, 104 AM. J. HYGIENE 587, 587–92 (1976) (describing the phenomenon of “confounding,” a distortion in an effect measure introduced by an extraneous variate in epidemiological experiments, as a fundamental challenge to establishing causal associations).

306. See *Save Our Cumberland Mountains v. Kempthorne*, 453 F.3d 334, 344–45 (6th Cir. 2006); *California v. Block*, 690 F.2d 753, 767–69 (9th Cir. 1982); see also Timothy F. Malloy, *Principled Prevention*, 46 ARIZ. ST. L.J. 105 (2014) (proposing an alternatives analysis shift away from the orthodox risk management paradigm which avoids the analytical traps of causation in chemical safety and other related fields of regulation); Anne Steinemann, *Improving Alternatives for Environmental Impact Assessment*, 21 ENVTL. IMPACT ASSESSMENT REV. 3, 13–14 (2001).

307. Cf. Kagan, *supra* note 224, at 2272–319 (observing that modern presidencies have solved for the interest-group capture and principal/agent problems by asserting more directives, reviews, and by appropriating agency initiatives).

308. See McCold & Saulsbury, *supra* note 269. “Using the existing environment as the baseline is not appropriate for cumulative impact assessments because doing so makes the effects of past and present actions part of the baseline rather than contributors to cumulative impacts.” *Id.* at 767.

309. Though common, use of the status quo as the baseline is an evasion of the 1978 CEQ rules. For example, a sockeye salmon run of 100 fish today, projected to be reduced no more than two percent by a proposed dam, can be found to be insignificantly impacted. Contextualizing the proposed dam with the knowledge that the sockeye run was once over 10,000 fish, on the other hand, accentuates past actions and their cumulative effects. See McCold & Saulsbury, *supra* note 269, at 768 (quoting Ron West, *Seeing the Forest for the Trees: An Analysis of Cumulative Impact in Environmental Documents*, PARK SCI., Summer 1991, at 21, 21). Baselines can be manipulated to make *future* impacts appear insignificant as well. In *Grand Canyon Trust v. FAA*, 290 F.3d 339 (D.C. Cir. 2002), FAA was permitting the construction of a replacement airport in St. George, Utah, near Zion National Park. Noise levels in the park were the chief concern, but FAA refused to consider other air travel in the vicinity unrelated to St. George’s commercial airport, *id.* at 340–41, and argued that commercial air traffic to/from St. George would increase regardless of the airport, making

agencies like the Forest Service, Bureau of Land Management, and National Park Service, the failure to do so has been a growing source of conflict and litigation,³¹⁰ as it has for the transportation agencies.³¹¹ Agency success rightly turns not as much on the finer methodological choices that inevitably arise as on whether the agency mounts an earnest assessment of its programs' impacts which the inexpert can understand and verify.³¹² Moreover, courts that have rejected agency findings limiting their analyses too narrowly have disproportionately relied upon the comments of sibling agencies or their expert participants.³¹³

Where predictive inferences rooted in expertise are reviewed by generalists, transparency often decides between an agency's success and its bearing the costs of *de novo* proceedings.³¹⁴ While the Ninth

the projected noise level changes from the new airport insignificant. *See id.* at 343–44. The court rejected FAA's "incremental" approach as inconsistent with CEQ's rule. *Id.* at 345–46.

310. *See, e.g.,* N.M. *ex rel.* Richardson v. Bureau of Land Mgmt., 565 F.3d 683, 714–16 (10th Cir. 2009); Or. Nat. Res. Council Fund v. Brong, 492 F.3d 1120, 1133–35 (9th Cir. 2007); Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt., 387 F.3d 989, 999–1001 (9th Cir. 2004); City of Sausalito v. O'Neill, 386 F.3d 1186, 1226–27 (9th Cir. 2004); Native Ecosystems Council v. Dombeck, 304 F.3d 886, 895–97 (9th Cir. 2002); Kern v. Bureau of Land Mgmt., 284 F.3d 1062, 1075–79 (9th Cir. 2002); Neighbors of Cuddy Mountain v. U.S. Forest Serv., 137 F.3d 1372, 1378–79 (9th Cir. 1998); City of Tenakee Springs v. Clough, 915 F.2d 1308, 1312–13 (9th Cir. 1990); Thomas v. Peterson, 753 F.2d 754, 759–60 (9th Cir. 1985), *abrogated by* Winter v. Nat. Res. Def. Council, Inc., 555 U.S. 7 (2008), *and* Monsanto v. Geertson Seed Farms, 561 U.S. 139 (2010).

311. *See, e.g.,* Kentucky Riverkeeper v. Rowlette, 714 F.3d 402, 407–11 (6th Cir. 2013); Ctr. for Bio. Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1200 (9th Cir. 2008); Davis v. Mineta, 302 F.3d 1104, 1122–26 (10th Cir. 2002); *Grand Canyon Trust*, 290 F.3d at 343; Sierra Club v. Marsh, 976 F.2d 763, 767 (1st Cir. 1992); Fritiofson v. Alexander, 772 F.2d 1225, 1240–47 (5th Cir. 1985), *abrogated by* Sabine River Auth. v. U.S. Dep't of Interior, 951 F.2d 669, 677 (5th Cir. 1992); Coal. for Canyon Pres. v. Bowers, 632 F.2d 774 (9th Cir. 1980).

312. *Compare* Colorado Wild v. U.S. Forest Serv., 435 F.3d 1204 (10th Cir. 2006) (rejecting challenges to Service's creation of three CATXs for routine timber harvest below set threshold sizes which Service had studied and found to merit categorical exclusion despite Service's use of questionable statistical techniques), *with* Sierra Club v. Bosworth, 510 F.3d 1016 (9th Cir. 2007) (vacating Service's creation of CATX for hazardous fuels reduction projects as arbitrary for failure to gather any evidence of past projects' insubstantial effects).

313. *See* Blumm & Brown, *supra* note 163, at 287–96; Blumm & Nelson, *supra* note 163, at 11–29.

314. More frequently than perhaps any other statutory agency action, NEPA cases involve district courts adding to the administrative record or remanding it for supplementation upon review. *See* Brodsky v. U.S. Nuclear Reg. Comm'n, 704 F.3d 113, 125 (2d Cir. 2013) (reviewing cases); Nat'l Audubon Soc'y v. Hoffman, 132 F.3d 7, 14 (2d Cir. 1997) (same); Animal Def. Council v. Hodel, 840 F.2d 1432, 1436–37 (9th Cir. 1988) (same); Cty. of Suffolk v. Sec'y of Interior, 562 F.2d 1368, 1384–85 (2d Cir. 1977) (same); Silva v. Lynn, 482 F.2d 1282, 1283–84 (1st Cir. 1973) (originating the notion that NEPA records are an exception to

Circuit's "substantial questions" doctrine making the presence of factual uncertainty a sufficient condition for NEPA "significance" may be an outlier,³¹⁵ most reviewing courts expect agencies' NEPA "hard look" to be transparent and rational. Adopting standards *ex ante* committing the agency to separating its consequences and probability estimates, to at least qualitatively identifying the uncertainties therein, and to periodically reviewing the agency's predictions' accuracy, would signal as much to the public and the judiciary.

Hence, a President acting pursuant to Article II could order that, in conducting their (retrospective) studies of their programs' cumulative significance and their own risk estimation methods, NEPA agencies coordinate to the maximum feasible extent with other interested and knowledgeable agencies to the end of developing "appropriate alternatives to recommended courses of action,"³¹⁶ including methods to quantify the variables they balance.³¹⁷ Part V explains some administrative law principles bearing on the trade-offs entailed.

V. THE PRESIDENT AND CEQ: THE POWER TO PROMPT SUBSTANTIVE NEPA

Even the presidency's constitutional skeptics agree that Article II powers are at their height when the President is setting priorities or

a general rule against adding to the administrative record). Especially for discretionary judgments turning on probabilistic inferences, proactive disclosures that facilitate informed participation and the building of an administrative record catering to the inexpert would seem to be in the agency's best interests. *See* *Portland Audubon Soc'y v. Endangered Species Comm.*, 984 F.2d 1534, 1548 (9th Cir. 1993); *Aqua Slide 'N' Dive Corp. v. Consumer Prod. Safety Comm'n.*, 569 F.2d 831, 837-38 (5th Cir. 1978); *Nova Scotia Food Prods. v. FDA*, 568 F.2d 240, 252 (2d Cir. 1977); *Texas v. EPA*, 499 F.2d 289, 297 (5th Cir. 1974); *Mobil Oil v. Fed. Power Comm'n.*, 483 F.2d 1238, 1259-60 (D.C. Cir. 1973).

315. *See supra* notes 216-217 and accompanying text.

316. 42 U.S.C. § 4332(2)(E) (2012).

317. Since 1978, CEQ's regulations have required that agencies "shall" fulfill all the requirements of section 102(2), i.e., aside from the detailed statement requirement of section 102(2)(C). *See* 40 C.F.R. §§ 1507.1-1507.3 (2015). And section 102(2)(E)'s "alternatives" mandate extends to *all* proposals involving "unresolved conflicts concerning alternative uses of available resources," and "not just the more limited scope of section 102(2)(C)." *Id.* § 1507.2(d). That is to say, section 102(2)(E)'s alternatives requirement involves no significance threshold—and none of the troubles that that threshold has entailed. Macro-risks to which any given contribution may be negligible, thus, remain fully within NEPA's purview if section 102(2)(E) were properly executed.

federal government's contribution to a threat as broadly scaled as global climate disruption figures to be substantial, the public rightly asks: is no one responsible? And when obvious biases and other deficits of reason drive alternatives analyses, the public rightly asks: why can't they correct for this? Presidents have lately responded by "owning" their subordinates' statutory programs and demanding their cooperation in coordinating the disparate elements of a sprawling executive establishment.³⁵³ Combined with the judiciary's fixation upon causation,³⁵⁴ the precarious equilibrium courts and agencies have hashed out has choked NEPA's potential: it is the President's prerogative and duty to respond.

NEPA split into procedural and substantive fractions decades ago. While the former has become one of the richest fields of U.S. environmental law through agency rulemakings and judicial doctrine, the latter has atrophied. The former has hardened into an intricate web of governing routines and duties while the latter has remained discretionary with covered agencies, undermining its very point. The former without the latter has allowed covered agencies to over-analyze localized, site-specific, and often reversible environmental harms while essentially ignoring macro-scale risks like global climate disruption. A President honing an environmental legacy would remedy this perverse over- and under-execution of NEPA.

353. See *supra* notes 280–282 and accompanying text.

354. See *supra* notes 191–198 and accompanying text.