

CLIMATE SCIENCE AND LAW FOR JUDGES

Procedural Techniques
Available in Climate Litigation



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Procedural Techniques Available for Climate Litigation

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This module is designed to introduce specialized procedural techniques that have been used in climate cases. While many of the techniques could be helpful in a variety of cases, this module will be most useful for judges hearing climate change-related tort litigation.

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I. Subject Matter Jurisdiction Issues

One of the first issues that any judge will need to assess is whether the particular climate change case in front of that judge involves federal law, state law, or some combination of the two. That issue will likely turn on the extent to which the federal Clean Air Act, 42 U.S.C. §§ 7401-7671q, directly governs or preempts the claims being litigated. While the scope of the Clean Air Act's preemption is still a matter of active litigation, the U.S. Supreme Court likely will follow its parallel decision regarding allowable state-law claims under the federal Clean Water Act, 33 U.S.C. §§ 1251-1388.¹

A. Clean Air Act “Pollutants” and the U.S. Supreme Court’s Decision in *Massachusetts v. EPA*

The U.S. Supreme Court resolved the issue of whether the Clean Air Act is relevant to climate change in *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007). The case turned on the Act's definition of “air pollutant”:

any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator [of the U.S. Environmental Protection Agency] has identified such precursor or precursors for the particular purpose for which the term “air pollutant” is used.²

According to the five-Justice majority in *Massachusetts v. EPA*, this definition plainly applies to greenhouse gas emissions:

On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word “any.” Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt “physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air.” The statute is unambiguous.³

¹ *City of Milwaukee v. Illinois*, 451 U.S. 304, 317-25 (1981) (holding that the federal Clean Water Act displaces the federal common law of interstate nuisance); *Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 497-500 (1987) (allowing interstate nuisance suits for water pollution based on the law of the *source state*).

² 42 U.S.C. § 7602(g).

³ 549 U.S. at 529 (footnote omitted).

This decision has not been overturned, although the Supreme Court has limited the EPA’s ability to directly regulate greenhouse gas emissions from stationary sources like power plants.⁴ In late June 2022, the U.S. Supreme Court decided *West Virginia v. EPA*, which limited the authority of the EPA to mandate that states replace fossil-fuel-fired power plants, especially coal-fired power plants. However, the Court did not overrule *Massachusetts v. EPA*.

B. Does the Clean Air Act Preempt State Tort Claims Related to Greenhouse Gas Emissions?

The existence of the Clean Air Act’s statutory framework to regulate greenhouse gas emissions displaces the *federal* common law of interstate torts, particularly federal interstate nuisance law—even if the U.S. Environmental Protection Agency has not yet regulated the greenhouse gas emissions at issue.⁵ Nevertheless, like most of the federal pollution control statutes, the Clean Air Act makes clear that it does *not* preempt—in fact that it *preserves*—all state-law claims related to air emissions in the Act’s citizen suit provision, 42 U.S.C. § 7604. Specifically, that section provides that “[n]othing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any emission standard or limitation or to seek any other relief (including relief against the Administrator or a State agency).”⁶

In light of a similar statutory savings clause in the Federal Water Pollution Control Act, better known as the Clean Water Act, and faced with a similar issue of whether that statute preempted *state* tort claims regarding water pollution, the Supreme Court determined that litigants *could* bring state-law tort claims against polluters, so long as they were based on the law of the state in which the *source* of the pollution was located.⁷ This logic prevents sources of interstate pollution from being subject to multiple states’ tort laws while still giving effect to the Act’s savings clause.

The same logic likely applies to state-law torts related to climate change, subjecting sources of greenhouse gas emissions to the tort law of their home states.⁸ Nevertheless, the Supreme Court has not yet ruled on this issue in the context of the Clean Air Act.

However, in the context of a climate change tort case, the Supreme Court *did* decide that federal appellate courts can review the entirety of district court remand orders when defendants remove a state court case to federal court on the basis of the federal civil rights or federal officers removal

⁴ *Utility Air Regulatory Group v. EPA*, 573 U.S. 302, 321-26 (2014).

⁵ *Am. Elec. Power Co., Inc. v. Connecticut*, 564 U.S. 410, 424-25 (2011).

⁶ 42 U.S.C. § 7604(e).

⁷ *Int’l Paper*, 479 U.S. at 495-500.

⁸ *See, e.g.*, *North Carolina ex rel. Cooper v. Tennessee Valley Authority*, 615 F.3d 291, 306-07 (4th Cir. 2010) (citing *International Paper Co.* to hold that “the law of the states where emissions sources are located . . . applies in an interstate nuisance dispute” in a public nuisance case based on emissions from TVA’s coal-fired power plants).

statutes, 28 U.S.C. §§ 1442, 1443.⁹ The Court has been using this decision as a reason to vacate and remand the climate change tort decisions that would have allowed state common-law claims related to climate change to proceed, on the grounds that the relevant *appellate* courts may have improperly refused to review the district court remand order.¹⁰

One issue that many of these cases raise is what law—federal or state—governs climate change torts by U.S. citizens against foreign or multinational corporations, which include most of the major oil and gas companies. Several courts have held that such international torts assert *federal* common-law claims and that either the Clean Air Act displaces that federal common law or that foreign policy precluded recognition of such a cause of action.¹¹

Nevertheless, opinions issued after remand from the Supreme Court so far suggest that the courts other than the U.S. Court of Appeals for the Second Circuit will allow state-law climate torts to proceed against these multinational fossil fuel companies. The U.S. Court of Appeals for the Fourth Circuit, for example, held that Baltimore’s claims under Maryland state law against BP, Crown Central, Chevron, ExxonMobil, ConocoPhillips, Phillips 66, Marathon Oil, Speedway, Hess, CNX, Consol Energy, Console Marine Terminals, and Shell did *not* raise federal questions and were *not* preempted under the foreign affairs doctrine, despite the fact that the court recognized the defendants’ status as “multinational oil and gas companies.”¹² Similarly, the U.S. Court of Appeals for the Ninth Circuit decided that the county of San Mateo’s state-law claims against Chevron, ExxonMobil, BP, Shell, CITGO Petroleum, ConocoPhillips, Phillips 66, Peabody Energy, Total, Arch Coal, Eni Oil & Gas, Rio Tinto, Anadarko Petroleum, Occidental, Repsol, Marathon, Hess, Devon Energy, Encana, and Apache did not raise any federal questions, although it did not as explicitly acknowledge the defendants’ multinational status.¹³

A potential alternate route for cases deemed to arise under federal law is the Alien Tort Statute, 28 U.S.C. § 1350, and the Supreme Court’s cases governing its use to assert common-law claims against

⁹ BP P.L.C. v. Mayor & City Council of Baltimore, 141 S. Ct. 1532, 1543 (2021).

¹⁰ See, e.g., Cty. of San Mateo v. Chevron Corp., 294 F. Supp. 3d 934, 938 (N.D. Cal. 2018), *affirmed in part, appeal dismissed in part, rehearing en banc denied*, 960 F.3d 586 (9th Cir. 2020), *vacated and remanded for reconsideration*, 2021 WL 2044534 (U.S. May 24, 2021); Mayor & City Council of Baltimore v. BP P.L.C., 388 F. Supp. 3d 538, 557-58 (D. Md. 2019), *affirmed on other grounds*, 952 F.3d 452 (4th Cir. 2020), *vacated and remanded on other grounds*, 141 S. Ct. 1532 (2021); Rhode Island v. Chevron Corp., 393 F. Supp. 3d 142, 149-50 (D.R.I. 2019), *affirmed on other grounds*, 979 F.3d 50 (1st Cir. 2020); *vacated and remanded on other grounds*, 2021 WL 2044535 (U.S. May 24, 2021); Bd. of Comm’rs of Boulder Cty. v. Suncor Energy (USA), Inc., 405 F. Supp. 3d 947, 963-72 (D. Colo. 2019), *affirmed on other grounds in part, appeal dismissed in part*, 965 F.3d 792 (10th Cir. 2020), *vacated and remanded on other grounds*, 2021 WL 2044533 (U.S. May 24, 2021).

¹¹ E.g., City of New York v. Chevron Corp., 993 F.3d 81, 100-03 (2d Cir. 2021); California v. BP P.L.C., 2018 WL 1054293, at **3-4 (N.D. Cal. 2018), and City of Oakland v. BP P.L.C., 325 F. Supp. 3d 1017, 1024-26 (N.D. Cal. 2018), *both vacated and remanded*, 960 F.3d 570 (9th Cir. 2020), *vacating opinion superseded*, 969 F.3d 895 (2020), *cert. denied*, 2021 WL 2405350 (U.S. June 14, 2021).

¹² Mayor & City Council of Baltimore v. BP PLC, ___ 4th ___, 2022 WL 1039685, at **1, 5-8, 14-18 (4th Cir. Apr. 7, 2022).

¹³ Cty. of San Mateo v. Chevron Corp., ___ 4th ___, 2022 WL 1151275, at **2, 18 (9th Cir. Apr. 19, 2022). *Accord*, Bd. of Cty. Comm’rs of Boulder Cty. v. Suncor Energy (USA), Inc., 25 F.4th 1238, 1249 (10th Cir. 2022).

foreign entities.¹⁴ However, while this statute technically remains available for some of these tort claims, the Court has also been narrowing the scope of the Alien Tort Statute.¹⁵

C. How Should the Court Assess the Plaintiff's Standing to Bring the Climate Lawsuit?

Federal courts have a formalized standing analysis that requires the plaintiff to have a concrete and particularized injury-in-fact that is fairly traceable to the defendant's conduct and can be redressed by the court.¹⁶ *Massachusetts v. EPA* suggested that state plaintiffs may be entitled to special solicitude regarding their standing to sue in federal courts.¹⁷

Many state courts follow a similar formula for standing as the federal courts, but some do not. Connecticut, for example, allows almost anyone to sue about environmental problems in its state courts.¹⁸

Given the variety of climate change lawsuits, the standing inquiry may vary from case to case. For example, in cases where the plaintiff seeks to force a government defendant to enact effective climate strategies, the plaintiff may lack standing either because the claims are too generalized,¹⁹ or because the court cannot offer redress through the plaintiff's requested relief.²⁰ However, in cases where the plaintiff is asserting a climate change-related tort (fraud, negligence, nuisance) and seeking damages, the lawsuit is unlikely to fail on standing grounds.²¹ Similarly, courts have allowed standing in climate change-based securities fraud litigation.²²

¹⁴ See, e.g., *Kiobel v. Royal Dutch Petroleum Co.*, 569 U.S. 108 (2013); *Jesner v. Arab Bank, PLC*, ___ U.S. ___, 138 S. Ct. 1386 (2018).

¹⁵ See, e.g., *Jesner*, 138 S. Ct. at 1403 (holding that it would be inappropriate to extend Alien Tort Statute liability to foreign corporations).

¹⁶ *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 560-61 (1992).

¹⁷ 549 U.S. at 516-25; see also *Connecticut v. Am. Elec. Power Co., Inc.*, 582 F.3d 309, 332-39 (2d Cir. 2009), *rev'd on other grounds*, 564 U.S. 410 (2011) (discussing state standing and the effect of *Massachusetts v. EPA* at length).

¹⁸ CT. GEN. STAT. § 22a-16. See also *Comer v. Murphy Oil USA*, 585 F.3d 855, 862 (5th Cir. 2009), *rehearing en banc and appeal dismissed*, 607 F.3d 1048 (2010) (discussing Mississippi's liberal standing requirements); *Kanuk ex rel. Kanuk v. Alaska Dep't of Nat. Res.*, 335 P.3d 1088, 1092-95 (Alas. 2014) (concluding that the plaintiff had "interest standing" under state law).

¹⁹ *Clean Air Council v. United States*, 362 F. Supp. 3d 237, 246-47 (E.D. Pa. 2019).

²⁰ *Id.* at 249-50; *Juliana v. United States*, 947 F.3d 1159, 1170-71 (9th Cir. 2020).

²¹ See *Connecticut*, 582 F.3d at 339-49 (finding standing to bring a nuisance claim); *Comer*, 585 F.3d at 862-64 (finding that the plaintiffs had standing for their nuisance, trespass, and negligence claims). *But see* *Native Village of Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863, 878-81 (N.D. Cal. 2009), *affirmed on other grounds*, 696 F.3d 849 (9th Cir. 2012), *cert. denied*, 569 U.S. 1000 (2013) (holding that plaintiffs failed to sufficiently show that the defendants caused their injuries in a nuisance claim).

²² E.g., *Ramirez v. ExxonMobil Corp.*, 334 F. Supp. 3d 832 (N.D. Tex. 2018).

D. Is the Political Question Doctrine Relevant?

Although a number of courts have dismissed climate change lawsuits on political question grounds, its relevance should be limited, such as when the president is actively negotiating an immediately applicable climate change treaty with other nations while the court is deciding the case. The political question doctrine is “primarily a function of the separation of powers,”²³ “designed to restrain the Judiciary from inappropriate interference in the business of the other branches of Government.”²⁴ In *Baker*, the Supreme Court described a political question as follows:

Prominent on the surface of any case held to involve a political question is found a textually demonstrable constitutional commitment of the issue to a coordinate political department; or a lack of judicially discoverable and manageable standards for resolving it; or the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion; or the impossibility of a court's undertaking independent resolution without expressing lack of the respect due coordinate branches of government; or an unusual need for unquestioning adherence to a political decision already made; or the potentiality of embarrassment from multifarious pronouncements by various departments on one question.²⁵

Importantly, the *Baker* Court also emphasized that “[u]nless one of these formulations is *inextricable* from the case at bar, there should be no dismissal for non-justiciability on the ground of a political question's presence.”²⁶ The doctrine is most applicable when the U.S. Constitution commits resolution of a specific dispute to another branch of the federal government²⁷—or when the lawsuit would interfere with the Executive's conduct of foreign relations.²⁸

Thus, the political question doctrine is for major separation-of-powers infringements that cannot be handled through other legal doctrines. Climate change cases seeking government action on climate change may raise separation-of-powers issues, but those are readily dealt with through standing redressability or more focused separation-of-powers analyses. Courts have said that climate change cases involving torts are simply not political questions.²⁹

²³ *Baker v. Carr*, 369 U.S. 186, 210 (1962).

²⁴ *United States v. Munoz-Flores*, 495 U.S. 385, 394 (1990).

²⁵ *Baker*, 369 U.S. at 217.

²⁶ *Id.* (emphasis added).

²⁷ *E.g.*, *Nixon v. United States*, 506 U.S. 224, 228, 238 (1993) (holding that the Constitution commits impeachment trials to the U.S. Senate).

²⁸ *E.g.*, *Johnson v. Eisentrager*, 339 U.S. 763, 789 (1950) (challenging the president's decision to deploy troops abroad).

²⁹ *Connecticut*, 582 F.3d at 321-32 (2d Cir. 2009), *rev'd on other grounds but aff'd as to the political question doctrine not being an obstacle*, 564 U.S. 410, 420 & n.6 (2011).

II. Handling Challenges to the Existence of Climate Change or Humans' Role in Causing It

While climate change cases have largely moved past these two issues, judges may still occasionally face a party who wants to challenge whether climate change exists or whether human beings play a substantial role in causing it—in toxic tort terms, the general causation issue, as opposed to the more pointed issue of whether specific defendants substantially contributed to climate change and its impacts. In the absence of the parties' acceptance of these facts, can a judge now take judicial notice of them?

Under Federal Rule of Evidence 201(b), “A judicially noticed fact must be one not subject to reasonable dispute in that it is either (1) generally known within the territorial jurisdiction of the trial court or (2) capable of accurate and ready determination by resort to sources whose accuracy cannot reasonably be questioned.” Even 10 years ago judges put climate change into the category of adjudicative facts that the parties must prove.³⁰ However, at this point, a judge probably could take judicial notice of both facts. The science has progressed to the point where climate scientists are unequivocally certain that climate change is occurring and that human beings are responsible for most of it. Specifically, the Intergovernmental Panel on Climate Change's (IPCC's) consensus reports have repeatedly reached these conclusions. The U.S. Courts of Appeals for the District of Columbia (D.C.) and Ninth Circuits accept the IPCC's reports as the “best science available” on climate change and its impacts.³¹ In addition, no U.S. or foreign court has ever credited arguments that climate change is not occurring or that it is not anthropogenic.

III. Case Management Issues

Many of the case management issues that climate change cases—especially climate change torts—raise are not peculiar to climate change cases. Judges deciding these cases may want to borrow some of the techniques developed for mass tort and toxic tort litigation. Helpful resources include:

- State Energy & Environmental Impact Center, New York University School of Law, *Looking Back to Move Forward: Resolving Health & Environmental Crises* (Hampden T. Macbeth, ed.: Environmental Law Institute, 2020).
- Craig, Gold, Green, Klein, & Sanders, *Toxic and Environmental Torts*, 2d ed. (West: forthcoming 2022).

³⁰ See *Crawford v. Countrywide Home Loans, Inc.*, 2010 WL 3273715, at *4 (N.D. Ind. 2010), *aff'd on this point*, 647 F.3d 642, 649-50 (7th Cir. 2011).

³¹ *In re Polar Bear Endangered Species Act Listing and Section 4(d) Rule Litigation*, 709 F.3d 1, 5-6, 15-16 (D.C. Cir. 2013); *Alaska Oil & Gas Ass'n v. Pritzker*, 840 F.3d 671, 679 (9th Cir. 2016), *cert. denied*, ___ U.S. ___, 138 S. Ct. 924 (2018); *Alaska Oil & Gas Ass'n v. Ross*, 722 Fed. Appx. 666, 668 (9th Cir. 2018).

- Robert Bilott, *Exposure: Poisoned Water, Corporate Greed, and One Lawyer's Twenty-Year Battle Against Dupont* (Atria Books, 2019).
- IUCN World Commission on Environmental Law, *Fighting Climate Change: A Best Practice Guide for Judges and Courts* (forthcoming 2022), <https://www.iucn.org/commissions/world-commission-environmental-law/our-work/climate-change/fighting-climate-change-a-best-practice-guide-judges-and-courts>.

A. Should the Case Be a Class Action?

The class action allows judges to efficiently resolve a large number of claims—or at least the common issues for a large number of claims—in a single proceeding. Federal Rule of Civil Procedure (FRCP) 23 lists four prerequisites to any class action: “(1) the class is so numerous that joinder of all members is impracticable; (2) there are questions of law or fact common to the class; (3) the claims or defenses of the representative parties are typical of the claims or defenses of the class; and (4) the representative parties will fairly and adequately protect the interests of the class.”³² Most states also allow for class actions and impose similar prerequisites. Moreover, climate change litigation, depending on the exact type of case, can warrant class certification for any of the three reasons recognized in FRCP 23(b)—the possibility of inconsistent judgment against the non-class party, the desirability of affording the entire class injunctive and/or declaratory relief, or the questions in common predominate.

Given these certification requirements, the plaintiffs’ (usually) request to proceed as a class can give defendants in climate change cases additional opportunities to delay the lawsuit through challenges to the certification, the suitability of the class representatives, or the definition of the appropriate class. Even so, the class action may remain the more efficient form of action when large numbers of similarly situated plaintiffs request the same relief, particularly declaratory relief and injunctive relief.

Plaintiffs have already styled numerous climate change cases as class actions. In *Comer v. Murphy Oil USA*, for example, the plaintiffs were residents and property owners along the Mississippi coast of the Gulf of Mexico who sued a number of oil and gas companies, alleging that those companies’ “operation of energy, fossil fuels, and chemical industries in the United States caused the emission of greenhouse gasses that contributed to global warming, viz., the increase in global surface air and water temperatures, that in turn caused a rise in sea levels and added to the ferocity of Hurricane Katrina, which combined to destroy the plaintiffs’ private property, as well as public property useful to them.”³³ They alleged Mississippi state common-law claims of public and private nuisance, trespass, negligence, unjust enrichment, fraudulent misrepresentation, and civil conspiracy and

³² FRCP 23(a).

³³ *Comer*, 585 F.3d at 859.

sought compensatory and punitive damages for injuries suffered during the hurricane.³⁴ They sought to proceed as a class action. While the appeal from the district court’s dismissal ultimately failed because the U.S. Court of Appeals for the Fifth Circuit lacked a quorum to proceed,³⁵ class action certification could have been an efficient means to resolve what likely would have been the crucial issue in common for all plaintiffs in the case: whether the plaintiffs could prove the causation they asserted. If the plaintiffs won that issue, the class could be dissolved or broken into subclasses to resolve the damages issues.

Similarly, the Greater Pennsylvania Carpenters’ Pension Fund brought its securities fraud action against ExxonMobil as a class action “on behalf of all persons who purchased or otherwise acquired Defendant ExxonMobil Corporation’s (‘ExxonMobil’) publicly traded common stock between March 31, 2014 and January 30, 2017, inclusive.”³⁶ Again, the class action was an appropriate mechanism for this lawsuit because the issue of whether ExxonMobil engaged in misrepresentation or fraud was identical to all class members and promoted judicial economy by resolving it for all class members at the same time.³⁷

However, if a climate change case qualifies as a class action under the Class Action Fairness Act (CAFA), that fact can affect whether a climate change case nominally based on state law can nevertheless be removed to federal court.³⁸ CAFA requires only minimal diversity for federal court jurisdiction, but the aggregate amount in controversy must exceed \$5,000,000 and there must be 100 or more class members.³⁹ Thus, when the state of Massachusetts sued ExxonMobil in Massachusetts state court alleging four causes of action under the Massachusetts Consumer Protection Act and arguing that ExxonMobil had defrauded both investors and consumers through its misrepresentations about climate change and climate change’s impacts on its profitability, ExxonMobil removed the case to federal court on grounds, inter alia, that the lawsuit was a CAFA class action.⁴⁰ After deciding that the claim really was a state-law claim,⁴¹ the U.S. District Court for the District of Massachusetts determined that CAFA did not bar remand to state court. While class actions certified under state statutes that are similar to Federal Rule of Civil Procedure (FRCP) 23 can trigger CAFA removal eligibility, here the court agreed with Massachusetts that the state had filed a *parens patriae* action, not a class action, and so CAFA removal did not apply.⁴²

B. Would Multidistrict Litigation Be Appropriate?

³⁴ *Id.* at 859-60.

³⁵ *Comer v. Murphy Oil USA*, 607 F.3d 1049, 1053-54 (5th Cir. 2010) (en banc).

³⁶ *Ramirez*, 334 F. Supp. 3d at 839.

³⁷ *Id.* at 839-40.

³⁸ 28 U.S.C. §§ 1332(d), 1453(b).

³⁹ *Id.* § 1332(d)(2).

⁴⁰ *Massachusetts v. ExxonMobil Corp.*, 462 F. Supp. 3d 31, 34-39 (D. Mass. 2020).

⁴¹ *Id.* at 39-44.

⁴² *Id.* at 48-51.

In the federal courts, similar actions pending in different judicial districts can be consolidated into a single court for pretrial proceedings. Specifically,

When civil actions involving one or more common questions of fact are pending in different districts, such actions may be transferred to any district for coordinated or consolidated pretrial proceedings. Such transfers shall be made by the judicial panel on multidistrict litigation authorized by this section upon its determination that transfers for such proceedings will be for the convenience of parties and witnesses and will promote the just and efficient conduct of such actions.⁴³

Like class actions, multidistrict litigation increases case resolution efficiency by resolving common issues in a single proceeding.

In climate cases, multidistrict litigation would be particularly appropriate when multiple lawsuits across the country allege virtually the same claims against the same defendant. For example, the growing number of securities fraud and consumer fraud cases against ExxonMobil alleging that it hid or lied about the potential impacts of climate change on its future profitability could become good candidates for consolidation. Multidistrict litigation might also be appropriate to resolve the admissibility of scientific evidence (for example, attribution science) if climate change tort lawsuits in multiple courts seek to hold a single defendant or small group of defendants liable for a particular climate event or impact (for example, the increased force and damage of a hurricane).

C. Should the Judge Encourage Alternative Dispute Resolution or Creative Settlement?

Judges have considerable case management discretion to encourage the parties to settle and to reach creative solutions that the winner-takes-all structure of trials does not allow. Particularly as cases move beyond jurisdictional issues to the merits and attribution science improves, and particularly in jurisdictions that adopt market share liability or other mechanisms to assign proportionate liability to defendants (see below), other resolutions may emerge that traditional litigation does not allow for. For example, if a plaintiff coastal community or tribe wants a relatively modest amount of money to help it adapt to sea-level rise, the defendant might be willing to offer an acceptable amount to avoid costly litigation and the potential public precedent of climate change liability—particularly if it becomes clear that at least some courts are willing to impose climate change tort liability on certain types of defendants. Public health testing, monitoring, and treatment when necessary might be an acceptable remedy in cases involving air pollution, harmful algal blooms, toxic shellfish, or climate change-driven spreads of diseases into new areas. Alternatively, if it becomes clear that what the plaintiffs *really* want is more involvement in a decisionmaking process,

⁴³ 28 U.S.C. §§ 1407(a).

the defendant may be willing to allow that greater involvement in the hopes of avoiding future litigation.

Relevant to this issue, Robert Bilott's *Exposure* describes a very creative and novel medical monitoring negotiation and remedy. The attorneys turned what would be in many cases unsatisfactory individual damages awards into a community-based health monitoring and testing program. Similarly innovative settlements might be appropriate when the climate change problem at issue centers on or involves increased exposure to toxics, as was true in the aftermath of Hurricane Harvey in Houston but could also arise in connection with harmful algal blooms and/or shellfish contamination resulting from warming marine and lake waters.

D. Would Tiered Discovery Aligned With Key Issues Facilitate Resolution and/or Focusing of the Case, Especially in Conjunction With Sequencing Issues for Summary Judgment or Trial?

Judges also have considerable discretion to manage discovery, often one of the most expensive aspects of cases involving novel science and/or mass torts. As one example, so many judges have allowed very limited discovery to assess personal or subject matter jurisdiction that the phrase “jurisdictional discovery” has entered the legal vocabulary.⁴⁴ Similarly, judges in toxic or mass torts cases, especially products liability cases, have long engaged in multiple rounds of limited discovery to resolve key or critical fact issues.⁴⁵

As part of the case management in certain kinds of climate change cases—especially the climate change tort cases—the judge may want to more actively schedule multiple rounds of limited discovery to match a sequence of issues that might prove dispositive. This technique may be particularly helpful when the issues might also be resolvable through summary judgment rather than trial. For example, in cases tied to a single or limited series of climate events (hurricanes, floods, drought), partial causation or chains of causation might become a critical issue. Contributory or comparative negligence might be similarly decisive, as might the issue of what was legally “foreseeable” to a reasonable person at a particular time.

In other kinds of trials, the availability of insurance may become, as a practicable matter, a key issue for both sides.⁴⁶ Resolving whether and how much insurance is available in mass torts or class

⁴⁴ *E.g.*, *Toys "R" Us, Inc. v. Step Two, S.A.*, 318 F.3d 446, 455-58 (3rd Cir. 2003).

⁴⁵ *E.g.*, *Dawson v. Bristol Lab'ys*, 658 F. Supp. 1036, 1042 (W.D. Ky. 1987) (allowing 90 days of discovery limited to the issue of what tetracycline does to teeth); *Sundstrom v. McDonnell Douglas Corp.*, 816 F. Supp. 577, 586 (N.D. Cal. 1992) (allowing limited discovery regarding the relative knowledge of the government and the manufacturer regarding defects in a fighter jet ejection seat).

⁴⁶ *See, e.g.*, *The AES Corp. v. Steadfast Ins. Co.*, 725 S.E.2d 532, 536-37 (Va. 2012) (holding that AES's insurance policy did *not* indemnify it against the Native Village of Kivalina's claims of negligence for causing climate change because

actions could prompt settlement or make other procedural techniques available, such as interpleader.

E. Are Admissibility Hearings Regarding Key or Novel Scientific Evidence and Expert Testimony Warranted and, If So, Should They Be Held Earlier Rather Than Later?

In federal courts, Federal Rule of Evidence 702 governs the admissibility of scientific evidence. The Supreme Court, in a trilogy of cases beginning with *Daubert v. Merrill Dow Pharmaceuticals*,⁴⁷ effectively required admissibility rulings on the reliability of scientific and other expert testimony, which can require substantial hearings if the evidence is new or controversial. Some of the science likely to arise in some kinds of climate change cases, such as attribution science in climate change tort cases, will likely require *Daubert* hearings in the federal courts. Such elaborate procedures may not be necessary in state courts that still adhere to the *Frye* “general acceptance” standard—although the evidence might well be excluded under that standard until it becomes well-accepted. However, many states have also adopted the *Daubert* standard.⁴⁸ As a result, judges in those courts will also have to conduct admissibility hearings.

The admissibility of this scientific evidence will often determine whether the plaintiffs’ case can go forward. As a result, the judge may want to focus pretrial proceedings relatively early on that admissibility hearing.⁴⁹

Moreover, judges may want to take note of the various tools that judges have used to mitigate their own lack of scientific expertise. For example, judges have appointed their own science experts to help them evaluate the parties’ arguments regarding their own and the other side’s experts.⁵⁰ Regarding climate change, in 2018, U.S. District Judge William Alsup ordered the parties in a climate change case to give him a tutorial on the science.⁵¹ Judges can also often appoint technical advisors to assist them. Additional sources on court-appointed expert witnesses and technical advisors include:

“Kivalina plainly alleges that AES intentionally released carbon dioxide into the atmosphere as a regular part of its energy-producing activities. Kivalina also alleges that there is a clear scientific consensus that the natural and probable consequence of such emissions is global warming and damages such as Kivalina suffered. Whether or not AES’s intentional act constitutes negligence, the natural or probable consequence of that intentional act is not an accident under Virginia law.”)

⁴⁷ 509 U.S. 579 (1993).

⁴⁸ See, e.g., *State v. Coon*, 974 P.2d 386, 392-93 (Alaska 1999); *State v. Sharpe*, 435 P.3d 887, 898-901 (Alaska 2019).

⁴⁹ Margaret A. Berger, *The Admissibility of Expert Testimony*, in FED. JUDICIAL CTR. & NAT’L RSCH. COUNCIL, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (3d ed. 2011).

⁵⁰ E.g., *Hall v. Baxter Healthcare Corp.*, 987 F. Supp. 1387, 1395 (D. Or. 1996) (describing this procedure for a *Daubert* hearing regarding the ability of silicone gel breast implants to cause disease).

⁵¹ Warren Cornwall, *In a San Francisco Courtroom, Climate Science Gets Its Day on the Docket*, SCIENCE.ORG (Mar. 22, 2018), <https://www.science.org/news/2018/03/san-francisco-court-room-climate-science-gets-its-day-docket>.

- Christopher S. Finnerty, Morgan T. Nickerson, & Jason C. Weida, *Behind the Curtain: Technical Advisers in Complex Cases*, LAW360 (May 27, 2016), <https://www.law360.com/articles/801492/behind-the-curtain-technical-advisers-in-complex-cases>.
- Josh Hartman & Rachel Krevans, *Counsel Courts Keep: Judicial Reliance on Special Masters, Court-Appointed Experts, and Technical Advisers in Patent Cases*, 14 SEDONA CONF. J. 61 (2013).
- Jane F. Thorpe, Alvina M. Oelhafen, & Michael B. Arnold, *Court-Appointed Experts and Technical Advisers*, Vol. 26, No. 4, LITIGATION (2000).

Daubert hearings and their equivalents in state courts are the subject of numerous judicial training opportunities and materials. The aim here is not to provide a full exposition of how to conduct these hearings, but rather to point out that some of the more novel aspects of climate science, such as attribution science, will likely require them. In form and procedure, climate change *Daubert* hearings are unlikely to differ significantly from *Daubert* hearings in toxic tort, medical tort, patent, or other similarly science-dependent litigation.

F. Would Bellwether or Test Trials Facilitate Settlement?

Should mass or class action climate change tort cases ever reach the damages phase, bellwether or test trials could serve as reality checks for *all* the parties and hence facilitate settlement. This technique was portrayed, for example, in the movie *Erin Brockovich*. Most often, the plaintiff tries its strongest case or subset of cases to a jury, allowing both sides to preview the results. Duke University's Bolch Judicial Institute provides a nice overview of bellwether trials at https://judicialstudies.duke.edu/sites/default/files/centers/judicialstudies/panel_5-bellwether_trials.pdf.

G. Would Intervenors or Amicus Briefs Aid the Court?

Voluntary intervenors and amicus briefs potentially offer judges different perspectives on a given case than the parties themselves are likely to do. Individuals, agencies, or nongovernmental organizations (NGOs) seeking to intervene as actual parties will be governed by FRCP 24 or the equivalent state provision. There is more than sufficient case law to govern these motions. Indeed, courts have already made a variety of intervention decisions in climate change cases.⁵²

⁵² See, e.g., *Juliana v. United States*, 2016 WL 183903, at **1-5 (D. Or. 2016) (allowing representative of the fossil fuel industries to intervene as of right as defendants in the Our Children's Trust climate change case but imposing restrictions on their participation); *Ctr. for Biological Diversity v. Brennan*, 571 F. Supp. 2d 1105, 1126-30 (N.D. Cal. 2007)

As with most issues in climate change litigation, the value of amici will vary depending on the exact circumstances of the case. In general, in the federal courts,

Courts have wide discretion in deciding whether to grant a third party leave to file an amicus brief. *In the Matter of the Search of Info. Associated with [redacted]@mac.com that is Stored at Premises Controlled by Apple, Inc.*, 13 F.Supp.3d 157, 167 (D.D.C. 2014) (citing *Nat'l Ass'n of Home Builders v. U.S. Army Corps of Eng'rs*, 519 F.Supp.2d 89, 93 (D.D.C. 2007)). An amicus brief is appropriate where “the brief will assist the judges by presenting ideas, arguments, theories, insights, facts, or data that are not to be found in the parties’ briefs.” *Voices for Choices v. Ill. Bell Tel. Co.*, 339 F.3d 542, 545 (7th Cir. 2003); *see also Jin v. Ministry of State Sec'y*, 557 F.Supp.2d 131, 137 (D.D.C. 2008) (holding that an amicus brief is appropriate where “the amicus has unique information or perspective that can help the court beyond the help that the lawyers for the parties are able to provide” (quoting *Ryan v. CFTC*, 125 F.3d 1062, 1064 (7th Cir. 1997))).⁵³

Courts often allow amici to submit briefs in cases where the meaning of a key law with respect to climate change or the validity of a new program addressing climate change is the focus of the litigation. For example, the Supreme Court allowed scores of individuals, industry groups, tribal groups, non-party states, and NGOs to file dozens of amicus briefs on both sides of the argument in *Massachusetts v. EPA*, and the majority opinion relied heavily on expert affidavits submitted by amici. Similarly, the D.C. Circuit allowed both multiple intervenors and multiple amici—including experts on the electric grid system—in the challenge to the Affordable Clean Energy Rule, the Trump Administration EPA’s replacement for the Obama Administration EPA’s Clean Power Plan, which sought to reduce greenhouse gas emissions from fossil-fuel-fired power plants.⁵⁴

Similarly, even in climate change tort cases, courts have been relatively open to amici when the court has been deciding some of the initial legal issues surrounding those cases. For example, when ruling on the justiciability of the Native Village of Kivalina’s climate change nuisance suit against multiple oil and gas companies, the Ninth Circuit allowed the American Chemistry Council, Public Nuisance

(disallowing a U.S. senator and U.S. congressman from intervening in a lawsuit alleging that the U.S. Climate Change Science Program was violating federal law).

⁵³ *WildEarth Guardians v. Zinke*, 368 F. Supp. 3d 41, 58-59 (D.D.C. 2019) (denying the New York University School of Law's Institute for Policy Integrity petition to submit an amicus brief in a case challenging the adequacy of the federal government’s consideration of climate change in granting a lease of federal public lands).

⁵⁴ *Am. Lung Ass’n v. U.S. Env’t Prot. Agency*, 985 F.3d 914, 922-28 (D.C. Cir. 2019), *cert. granted sub nom. West Virginia v. EPA*, 142 S. Ct. 420 (2021). *See also* *Ass’n of Washington Bus. v. Washington State Dep’t of Ecology*, 455 P.3d 1126, 1127 (Wash. 2020) (allowing the Puget Sound Clean Air Agency to participate as amicus in a challenge to the WDOE’s new clean air rule that required natural gas distributors and petroleum product producers to pay to offset the emissions caused by third parties using their products); *Ass’n of Irrigated Residents v. California Air Res. Bd.*, 206 Cal. App. 4th 1487, 1489 (1st Dist. 2012) (allowing the Environmental Defense Fund and Bay Area Council to participate as amici in a case asserting that CARB was violating California’s Global Warming Solutions Act).

Fairness Coalition, American Coatings Association, Property Casualty Insurers Association of America, Solar Industry, National Association of Manufacturers, National Federation of Independent Small Business Legal Center, American Tort Reform, Natso Inc., Association of International Automobile Manufacturers, Congressman Lamar Smith, Congressman F. James Sensenbrenner, Jr., Center for Constitutional Jurisprudence, Washington Legal Foundation, Pacific Legal Foundation, and Chamber of Commerce of the United States of America to participate as amici.⁵⁵ The New Mexico Court of Appeals allowed numerous environmental law professors, state officials, Native American NGOs, and environmental NGOs to participate as amici when it decided the Our Children's Trust public trust climate case against the state of New Mexico.⁵⁶

In contrast, amici might be of more limited value in climate change tort cases that progress to the actual tort issues. For example, in the tort cases growing out of Hurricane Harvey's devastation of Houston, one of the key issues is likely to be what defendants like Arkema Chemicals or the U.S. Army Corps of Engineers reasonably should have foreseen and prepared for in light of previous hurricanes and projections for worsening hurricanes. While expert testimony is likely to be critical on that issue, amici are unlikely to be very helpful unless they themselves are offering expert affidavits. In contrast, the hurricane itself and responses to it had significant environmental justice impacts. Amicus briefs from representatives of the affected communities thus might be very helpful to a judge after liability is established and the parties are trying to negotiate, or it falls to the judge to rule on, an appropriate remedy.

It is difficult to generalize when amici participation would be helpful to a judge, and of course some of that decision rests in the judge's own preferences and the specific people or groups who seek to submit amicus briefs in a particular case. Nevertheless, it might be prudent for a judge to consider amicus petitions when either the climate change harm alleged or the relief sought has community or regional implications and one or more of the following are true: (1) Native American tribes have treaty and/or federal water rights that could be impacted; (2) Native Hawaiian or Native Alaskan interests exist; (3) environmental justice communities exist whose interests may not be adequately represented by the parties; (4) endangered, threatened, or otherwise protected species (under either state or federal law) exist in the area; (5) water rights or private property could be affected; (6) public lands (federal or state) could be affected; or (7) hunting, fishing, or tourism interests could be affected.

IV. Mandamus, Stays, and Interlocutory Appeals

The history of *Julianna v. United States* demonstrates the extent to which the *parties* in a climate change lawsuit might use procedural maneuvering to avoid or delay a final judgment on the merits. In 2016, the U.S. District Court for the District of Oregon held in *Julianna* as part of a denial of a motion to

⁵⁵ *Native Village of Kivalina*, 696 F.3d at 852.

⁵⁶ *Sanders-Reed ex rel. Sanders-Reed v. Martinez*, 350 P.3d 1221, 1222 (N.M. App. 2015).

dismiss that there is a fundamental due process right to a stable climate system, because “a stable climate system is a necessary condition to exercising other rights to life, liberty, and property.”⁵⁷ Before the case could go to trial on whether the United States had violated that right, however, the federal defendants pursued two years of legal maneuvering. First, the district court denied the government’s motion for interlocutory appeal in June 2017.⁵⁸ The federal government twice sought mandamus orders to dismiss from the Ninth Circuit,⁵⁹ and once from the Supreme Court,⁶⁰ only to be denied in all three instances. In October 2018, the district court did agree to dismiss the president as a defendant.⁶¹ However, it again refused to certify its other legal rulings for interlocutory appeal.⁶² In response to this new decision, the United States again appealed to the Supreme Court, which first stayed the case,⁶³ and then vacated its own order three weeks later.⁶⁴ The Ninth Circuit then stepped in and stayed the case, inviting the district court to revisit its decisions regarding an interlocutory appeal, and the district court finally certified the appeal.⁶⁵ As a result of this certification, the Ninth Circuit eventually dismissed the case for lack of standing.⁶⁶

Notably, a petition for a writ of mandate or mandamus remains the cause of action in many states to force a state agency to take action on climate change. Outside of *Juliana*, however, the use of mandamus against the *judge* deciding a climate change case remains relatively rare.

Requests for stays have been most common in two contexts in climate change cases: (1) the normal requests for a stay of a judgment pending appeal⁶⁷; and (2) stays in existing challenges to a prior administration’s regulations to allow a new political agenda to advance, which has been most common in the federal courts in the wake of the last two presidential elections. It remains an open question how long federal courts will continue to respond to the federal government’s requests for stays in cases in the second category. As one example, the D.C. Circuit issued its opinion invalidating the Trump Administration’s Affordable Clean Energy Rule the day before President Joe Biden took office, and the lengthy opinion suggested that the court had gone a long way down the path of writing an opinion upholding the Obama Administration’s Clean Power Plan before granting the Trump Administration’s request to wait.⁶⁸ In a non-climate change context, this tension is also apparent in *Pascua Yaqui Tribe v. United States Environmental Protection Agency*, where the U.S.

⁵⁷ *Juliana v. United States*, 217 F. Supp. 3d 1224, 1250 (D. Or. 2016).

⁵⁸ *Juliana v. United States*, 2017 WL 2483705 (D. Or. June 8, 2017).

⁵⁹ *In re United States*, 884 F.3d 830, 837-38 (9th Cir. Mar. 7, 2018); *In re United States*, 895 F.3d 1101, 1106 (9th Cir. July 20, 2018).

⁶⁰ *United States v. U.S. Dist. Court for Dist. of Oregon*, 139 S. Ct. 1, 1 (July 30, 2018).

⁶¹ *Juliana v. United States*, 339 F. Supp. 3d 1062, 1076-80 (D. Or. Oct. 15, 2018).

⁶² *Id.* at 1104-05.

⁶³ *In re United States*, 139 S. Ct. 16, 16 (Oct. 19, 2018).

⁶⁴ *In re United States*, 139 S. Ct. 452, 453 (Nov. 2, 2018).

⁶⁵ *Juliana v. United States*, 2018 WL 6303774, at *3 (Nov. 21, 2018) (referencing *United States v. U.S. District Court for District of Oregon*, Case No. 18-73014, Order Dated Nov. 8, 2018 (9th Cir. 2018)).

⁶⁶ *Juliana*, 947 F.3d at 1173-75.

⁶⁷ *See In re Florida Southeast Connection, LLC; Transcontinental Gas Pipe Line Co., LLC, & Sabal Trail Transmission, LLC*, 2016 WL 1270727 (FERC Mar. 30, 2016).

⁶⁸ *Am. Lung Ass’n*, 985 F.3d 914, *four petitions for certiorari filed April-June 2021*.

District Court for the District of Arizona granted the Biden Administration EPA’s request for a voluntary remand of the Trump Administration EPA’s Navigable Waters Protection Rule—but only after also granting the plaintiff tribes’ motion to vacate the rule.⁶⁹ Nevertheless, in a climate change case challenging a federal or state regulation where the relevant agency has clearly demonstrated that it is in the process of repealing and/or replacing that rule, stays in the pending litigation may still conserve judicial resources and avoid significant investment in litigation that will soon be moot.

Similarly, allowing interlocutory appeals of threshold or novel rulings of law in climate change cases can similarly conserve judicial and party resources. As in *Juliana*, such collateral orders might relate to standing or, in the background of that appeal, the recognition of a new constitutional right. They might involve the applicability of existing statutes to a climate change issue.⁷⁰ As climate torts move forward through the courts, such collateral orders may increasingly decide which state’s tort law applies to each defendant (i.e., a choice of law analysis), whether a particular defendant is entitled to total or qualified immunity, or whether a state has adopted or will adopt new causes of action and remedies, such as medical monitoring or market share liability. The main point is that, as climate change tort law is being developed, interlocutory appeals and the collateral order doctrine can provide some assurance to all parties that the case will not be overturned after a long and expensive trial on the basis of an initial legal decision, particularly when that decision (like choice of law) can be corrected and the case continued on a surer legal footing.

V. Applying Climate Change Science in the Different Kinds of Climate Change Lawsuits

A. Administrative Law Cases

Climate change administrative law cases include challenges to agency regulations or assertions that an agency is failing to adhere to a climate change statutory mandate. These cases do not differ fundamentally from any other administrative law case. As *Massachusetts v. EPA* amply demonstrated, the federal Administrative Procedure Act and the administrative law provisions of the Clean Air Act were more than sufficient to legally resolve the EPA’s failure to regulate greenhouse gases; in a state-law case, the same will be true for the relevant state’s administrative and mandamus law.

However, as is true in any area of administrative law where the agencies engage with complex or detailed scientific and technical knowledge, understanding whether the agency’s decision is in fact

⁶⁹ ___ F. Supp. 3d ___, 2021 WL 3855977, at **2-4 (D. Ariz. Aug. 30, 2021).

⁷⁰ See, e.g., *Competitive Enter. Inst. v. Mann*, 150 A.3d 1213, 1228-32 (D.C. App. 2016) (allowing interlocutory appeal of the trial court’s denial of the defendant’s special motions to dismiss under the District of Columbia’s Anti-SLAPP Act, in part because the applicability of that Act to a climate scientist’s claims of defamation and intentional infliction of emotional distress based on challenges to his published work presented a case of first impression).

“arbitrary and capricious” or based on substantial evidence may require the judge to become educated about those scientific and technical complexities. As one example, the Obama Administration EPA concluded that the Clean Power Plan would not disrupt the availability and distribution of electricity in the United States, but any judge ruling on the validity of that conclusion would need to understand a fair amount about electricity grids, peak demand, and distributors’ abilities to shift between sources of generation.

B. Contracts and Securities Cases

While climate change contract cases have been limited to date, at the very least insurance contract litigation will likely increase relatively soon. Similarly, securities fraud cases like those developing against ExxonMobil will likely require close reading of securities disclosure documents and resolving issues of what a reasonable and prudent investor would have understood. Nevertheless, climate-related contracts or securities cases are unlikely to require new kinds of remedies.

Climate science is likely to be most relevant in these cases when a judge or jury must compare a climate-related statement in a document to climate science as understood at the moment the statement was made. For example, if a contract states that one party’s obligation is waived if “an unforeseen” climate impact makes performance impossible, scientific reconstruction of what a reasonable person could have foreseen on the date of contracting may be necessary, particularly if the contract has been in force for several years.

C. Climate Change Torts Cases

As these materials have suggested throughout, climate change torts are likely to raise some of the most challenging issues for courts, in terms both of the science and of the remedies available, as well as who the appropriate parties are, both plaintiffs and defendants. It is here that judges may want to become familiar with—and perhaps adopt—some of the tools and techniques developed for toxic tort litigation.

1. Causation, Relative Risk, Probabilistic Evidence, and Attribution Science

In any case alleging that the defendants “caused” a climate change impact, the judge will need to pay close attention to the exact allegation. A case alleging that a defendant failed to prepare for the foreseeable risks in a particular location and that that failure resulted in all damages or increased damages to the plaintiffs is likely to be a qualitatively different evidentiary battle from the many cases already filed that are attempting to hold defendants liable for climate change itself. Whether a defendant failed to prepare for the “100-year flood” or a storm surge of 30 feet, and whether that failure constitutes negligence, are fairly routine torts analyses. In contrast, whether any group of defendants can be held liable for climate change itself, or even a particular climate change impact, may require complex analyses of how attribution science and statistical probabilities inform comparative fault, proximate cause and foreseeability, reasonableness, and proportionate liability.

Many climate impacts still can only be assessed in terms of risk or statistical probabilities. In deciding how to handle this kind of evidence, judges in climate change cases might profitably look to how judges in toxic tort or products liability cases have handled similar evidentiary uncertainties. For example, in assessing whether toxic torts plaintiffs have shown that a drug or chemical more likely than not caused the plaintiffs' diseases or injuries, many courts require a scientifically valid showing that the plaintiffs' exposure raises the relative risk of the disease to 2.0 or higher, the epidemiological equivalent of "more probable than not."⁷¹ While epidemiology is unlikely to be the relevant probabilistic science in a climate change case, the toxic torts treatment of probabilistic evidence and statistics in the proof of causation is worth examining in the face of analogous climate change evidence (for example, how certain are scientists that climate change made a particular hurricane worse than it otherwise would have been?).

2. Defenses

Numerous defenses may need reevaluation in light of climate change. As the Virginia Supreme Court's insurance decision shows, for example, how to define an "accident" in the context of climate change can be complicated. Similarly, "act of God" and *force majeure* defenses may require courts to carefully evaluate the foreseeability and human causation component of climate change-induced damages. These decisions will require judges to apply legal principles in light of a thorough understanding of both climate change generally and location-specific climate predictions and expectations.

3. Defendant Identification/Attribution and Shared Liability

The courts and legislatures have already developed several doctrines to handle cases in which multiple parties share fault. For example, contributory and comparative negligence govern how to handle liability when both the plaintiff and the defendant contributed to the problem. One can easily imagine a case like the Hurricane Katrina property owners case, for example, turning into a battle where the plaintiffs argue that the defendant oil companies are responsible for climate change or the strength of a particular hurricane, while defendants argue that the plaintiff coastal landowners failed to put their houses on stilts or otherwise properly adapt to increasing hurricane risk. In such circumstances, the relevant state's choice between contributory and comparative negligence could prove dispositive.

As noted, in a number of the climate change tort cases, plaintiffs have sued multiple defendants in a single or related industry—generally the largest fossil-fuel energy-producing corporations. Eventually, these lawsuits may get to the issue of how to divide liability among these multiple defendants. Equitable apportionment, joint and several liability, and market share liability already exist as legal tools for judges to use at this stage of litigation. This module assumes that most judges

⁷¹ See, e.g., *Merck & Co., Inc. v. Garza*, 347 S.W.3d 256, 266-67 (Tex. 2011); *In re Joint Eastern & Southern Dist. Asbestos Litig.*, 52 F.3d 1124, 1128 (2d Cir. 1995).

are familiar with equitable apportionment and joint and several liability, which should apply no differently to climate change torts than they do to non-climate tort cases.

The most controversial of these liability-sharing doctrines is market share liability. Only a few states have adopted this doctrine, and even those states severely limit its applicability.⁷²

Most basically, market share liability provides plaintiffs with a substitute mechanism to prove causation when the plaintiff cannot identify which of a set of similarly situated defendants actually caused the plaintiff's harm. The California Supreme Court invented market share liability in 1980 to deal with a particularly difficult toxic tort situation: DES daughters.⁷³ Doctors prescribed diethylstilbesterol (DES) to women between 1941 and 1971 to prevent miscarriages. However, it later became clear that the drug caused a variety of health problems for the daughters exposed to it *in utero*, including a signature cancer. By the time these health problems manifested in the daughters, records regarding which manufacturer's DES the mother had ingested were usually unavailable, making it impossible for the injured daughters to attribute their diseases to specific drug company defendants. The California Supreme Court fashioned what came to be known as market share liability as an extension of its decision in *Summers v. Tice*,⁷⁴ a case that held two hunters jointly and severally liable when it was clear that one of them had shot and injured the plaintiff. *Summers v. Tice* effectively shifted the burden of identifying the responsible defendant from the innocent plaintiff to the negligent defendants themselves. As in *Summers*, market share liability shifts the burden of defendant identification to the defendants based on the same policy considerations—namely, that as between innocent plaintiffs and the defendants who profited from defective products that cause disease, the latter should not escape liability simply because the former cannot precisely identify whose product was involved.⁷⁵

However, market share liability also addresses the fact that many more defendants may be potentially liable than a plaintiff can sue; for example, over 200 companies manufactured the DES that Sindell's mother might have ingested. Thus, the *Sindell* court concluded:

Where, as here, all defendants produced a drug from an identical formula and the manufacturer of the DES which caused plaintiff's injuries cannot be identified through no fault of plaintiff, a modification of the rule of *Summers* is warranted. As we have seen, an undiluted *Summers* rationale is inappropriate to shift the burden of proof of causation to defendants because if we measure the chance that any particular

⁷² Compare *New Hampshire v. ExxonMobil Corp.*, 126 A.3d 266, 294-99 (N.H. 2015) (upholding the trial court's use of market share liability for MTBE contamination); *In re Methyl Tertiary Butyl Ether (MTBE) Products Liability Litig.*, 725 F.3d 65, 115-16 (2d Cir. 2013) (upholding trial court's use of market share liability for MTBE contamination), *with* *Wallace & Gale Asbestos Settlement Trust v. Busch*, 211 A.3d 1166, 1176 (Md. Ct. App. 2019) (refusing to apply market share liability to asbestos exposure).

⁷³ *Sindell v. Abbott Lab'ys*, 26 Cal. 3d 588 (1980).

⁷⁴ 33 Cal. 2d 80, 86 (1948).

⁷⁵ *Sindell*, 26 Cal. 3d at 610-11.

manufacturer supplied the injury-causing product by the number of producers of DES, there is a possibility that none of the five defendants in this case produced the offending substance and that the responsible manufacturer, not named in the action, will escape liability.

But we approach the issue of causation from a different perspective: *we hold it to be reasonable in the present context to measure the likelihood that any of the defendants supplied the product which allegedly injured plaintiff by the percentage which the DES sold by each of them for the purpose of preventing miscarriage bears to the entire production of the drug sold by all for that purpose.* Plaintiff asserts in her briefs that Eli Lilly and Company and 5 or 6 other companies produced 90 percent of the DES marketed. If at trial this is established to be the fact, then there is a corresponding likelihood that this comparative handful of producers manufactured the DES which caused plaintiff's injuries, and only a 10 percent likelihood that the offending producer would escape liability.⁷⁶

Nevertheless, what market share liability gives to plaintiffs in causation, it also withdraws from the actual damages awarded. Specifically, the defendants' respective market share then becomes the basis for apportioning liability among multiple defendants:

The presence in the action of a substantial share of the appropriate market also provides a ready means to apportion damages among the defendants. Each defendant will be held liable for the proportion of the judgment represented by its share of that market unless it demonstrates that it could not have made the product which caused plaintiff's injuries. In the present case, as we have seen, one DES manufacturer was dismissed from the action upon filing a declaration that it had not manufactured DES until after plaintiff was born. Once plaintiff has met her burden of joining the required defendants, they in turn may cross-complaint against other DES manufacturers, not joined in the action, which they can allege might have supplied the injury-causing product.

Under this approach, each manufacturer's liability would approximate its responsibility for the injuries caused by its own products. Some minor discrepancy in the correlation between market share and liability is inevitable; therefore, a defendant may be held liable for a somewhat different percentage of the damage than its share of the appropriate market would justify. It is probably impossible, with the passage of time, to determine market share with mathematical exactitude. But just as a jury cannot be expected to determine the precise relationship between fault and liability in applying the doctrine of comparative fault or partial indemnity, the difficulty of apportioning

⁷⁶ *Id.* at 611-12 (emphasis added).

damages among the defendant producers in exact relation to their market share does not seriously militate against the rule we adopt.⁷⁷

In contemporary application, courts allowing the use of market share liability generally require the plaintiff to establish four things. First, the offending substance must be fungible, i.e., there is no way to distinguish from the product itself who likely produced it. Second, there is no reasonable way for the plaintiff to trace which company produced the product that caused the plaintiff's injury. Third, as a result, the plaintiff faces an impossible burden in trying to identify the exact defendant or defendants that caused the plaintiff's injury. Fourth, nevertheless, the plaintiff *can* identify the manufacturers who produced a substantial share of the problematic product likely to have caused the plaintiff's harm.⁷⁸

While no published case has yet addressed the applicability of market share liability to climate change, some version of it may eventually prove useful in the climate change lawsuits against the major fossil fuel corporations that are amenable to suit in the United States (i.e., not foreign state-owned enterprises). The greenhouse gases are certainly fungible and, once they mix in the atmosphere, it becomes impossible to identify whose greenhouse gas emissions caused what harm. Nevertheless, scholars have also noted at least three potential problems with applying market share liability in climate change lawsuits: (1) climate change impacts depend upon the cumulative impacts of *all* greenhouse gas emissions, suggesting that joint and several liability might be more appropriate; (2) every climate change plaintiff has *also* emitted greenhouse gases, suggesting that a comparative or contributory fault framework might be more appropriate; and (3) significant policy decisions need to be made regarding how to circumscribe the emissions for which particular defendants are directly responsible. For example, are corporations that mine and refine petroleum and then market gasoline and diesel responsible only for the greenhouse gases they actually emit during the mining and manufacturing processes, or are they also responsible for the greenhouse gases consumers emit when using the gasoline and diesel that the company produced? Moreover, can they be held liable for emissions from activities affirmatively sanctioned by the government? For further discussion of these and other issues, see: Justine S. Hastings & Michael A. Williams, *Market Share Liability: Lessons From New Hampshire v. ExxonMobil*, 34 J. ENV'T L. & LITIG. 219, 248-51 (2019); Logan L. Page, *Note, Write This Down: A Model Market-Share Liability Statute*, 68 DUKE L.J. 1469, 1506 (2019); Samantha Lawson, *Note, The Conundrum of Climate Change Causation: Using Market Share Liability to Satisfy the Identification Requirement in Native Village of Kivalina v. ExxonMobil*, 22 FORDHAM ENV'T L. REV. 433 (2011); Daniel J. Grimm, *Note, Global Warming and Market Share Liability: A Proposed Model for Allocating Tort Damages Among CO₂ Producers*, 32 COLUM. J. ENV'T L. 209 (2007).

⁷⁷ *Id.* at 612-13 (internal citations omitted).

⁷⁸ *New Hampshire*, 126 A.3d at 294-98.

VI. The Role of the Judge: An Extended Example

When Hurricane Harvey, a Category 4 hurricane, made landfall on the central Texas coast just north of Corpus Christi on August 25, 2017, it demonstrated both the power and the danger of coastal storms in our new climate change era. Harvey was huge; at its first landfall, the hurricane was 280 miles in diameter and had 130 mile-per-hour winds. It moved north to Houston the next day and remained there for four days, bringing record-breaking rainfall. Harvey dropped two feet of rain on Houston in the first 24 hours and 40 inches over 48 hours. Two reservoirs overflowed, and much of the city was essentially underwater. This flooding spread toxicity everywhere. Specifically, Harvey flooded 800 wastewater treatment facilities and 13 of the Houston area's 41 hazardous waste sites. The *New York Times* described Harvey's floodwaters as "a stew of toxic chemicals, sewage, debris and waste Runoff from the city's sprawling petroleum and chemicals complex contains any number of hazardous compounds. Lead, arsenic and other toxic and carcinogenic elements may be leaching from some two dozen Superfund sites in the Houston area."⁷⁹

Houston's numerous oil refineries contributed to the toxicity problems. In late August, ExxonMobil acknowledged "that Hurricane Harvey damaged two of its refineries, causing the release of hazardous pollutants"—specifically, high emissions of volatile organic compounds and over 1 million pounds of sulfur dioxide, both of which are regulated air pollutants under the Clean Air Act.⁸⁰ Initial reports from Texas regulators indicated that because of Hurricane Harvey, "the region's massive petrochemical industry released more than 2 million pounds of harmful pollutants into the air as of Aug. 29"—"roughly 40 percent of what the . . . entire Houston area released in 2016"⁸¹

Houston is also home to, or near, 500 chemical plants, many of which were flooded. One of the worst hit chemical plants during Hurricane Harvey was the Arkema chemical plant, about 20 miles northeast of Houston, which is considered one of the most hazardous plants in Texas. Harvey's rains inundated the plant, causing it to lose power, which in turn led to a loss of refrigeration. Unfortunately, the plant manufactures organic peroxides, which must be kept very cool or they explode—exactly what happened at Arkema multiple times over the course of a week. The chemical fumes and noxious smoke forced over 200 residents to evacuate, and at least 21 people required medical attention as a result, including 15 first responders who arrived at the Arkema plant to deal with the explosions and fires.

All of the many lawsuits that resulted from Hurricane Harvey are arguably climate change lawsuits, because Harvey is one of the first hurricanes for which scientists were able to find a climate footprint that shows that climate change made a significant contribution to the storm's severity.

⁷⁹ Hiroko Tabuchi & Sheila Kaplan, *A Sea of Health and Environmental Hazards in Houston's Floodwaters*, N.Y. TIMES (Aug. 31, 2017), <https://www.nytimes.com/2017/08/31/us/houston-contaminated-floodwaters.html?mcubz=1>.

⁸⁰ Steven Mufson, *ExxonMobil Refineries Are Damaged in Hurricane Harvey, Releasing Hazardous Pollutants*, WASH. POST (Aug. 29, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/08/29/exxonmobil-refineries-damaged-in-hurricane-harvey-releasing-hazardous-pollutants/?utm_term=.d8ccfb69eaf7.

⁸¹ Adam Allington, *Flooded Houston Facing Air Threat, Too, With Toxic Gas Releases*, in BNA, *Natural Disasters Cast Unexpected Light on Environmental Hazards, Regulatory Gaps* 1, 1 (Oct. 2017) (quoting Elena Craft).

While scientists still will not assert that climate change “causes” any particular coastal storm, in December 2017, two research groups concluded that Harvey’s record rainfall “was as much as 38 percent higher than would be expected in a world that was not warming.”⁸² Warmer-than-normal air and ocean water temperatures, sea levels that are six inches higher than 20 years ago, and climate change-affected weather patterns that promote storm stalling may all have contributed to Harvey’s record-breaking precipitation. In addition, both studies “found that climate change roughly tripled the odds of a Harvey-type storm.”⁸³

In light of this module and what you have learned in previous modules, how would you address the following issues and/or manage the cases that generated them? (These issues are derived from both real post-Harvey litigation and currently fictitious but entirely plausible climate change litigation that Harvey could have inspired.)

- In lawsuits brought by state environmental regulators, the injured first responders, and residents whose properties were contaminated during the Arkema explosions and fires, Arkema claims that it was not negligent because it took all reasonable precautions against reasonably anticipated hurricane flooding and Harvey’s flooding was “unprecedented.”
- Arkema also asserts that it is entitled to an “act of God” defense under Texas state law despite the fact that the explosions resulted at least in part from human-induced climate change increasing Harvey’s severity.
- The many residents of Houston who lacked flood insurance bring a class action against the petroleum companies located in and near Houston, claiming in the alternative that those companies are responsible for either all of Harvey’s flood damage or the flood damage attributable to Harvey’s climate change-induced severity. They base their claims on Texas public nuisance law and Texas negligence law and argue that the companies are jointly and severally liable for the flood damage.
- Over 5000 residents of Houston sue all the private sources of toxic contamination, alleging negligence in failing to adapt to climate change risks and seeking long-term medical monitoring to detect any long-term health effects they suffer as a result of their cumulative toxic exposures.
- Companies insuring both residential property owners and the various flooded industries sue the city of Houston, various state agencies, and the state of Texas, claiming that these

⁸² Henry Fountain, *Scientists Link Hurricane Harvey’s Record Rainfall to Climate Change*, N.Y. TIMES (Dec. 13, 2017), https://www.nytimes.com/2017/12/13/climate/hurricane-harvey-climate-change.html?_r=0; Michael Greshko, *Climate Change Likely Supercharged Hurricane Harvey*, NAT’L GEOGRAPHIC (Dec. 13, 2017), <https://news.nationalgeographic.com/2017/12/climate-change-study-hurricane-harvey-flood/> (reporting the same 38 percent high).

⁸³ Greshko, *Climate Change*, *supra* note 82.

governments intentionally or negligently failed to implement and require reasonable climate change adaptation measures, increasing the insurance companies' liability exposure to their insureds.

- At the same time, a variety of companies and citizens with casualty insurance policies sue their insurance companies when those insurance companies refuse to pay for Harvey-caused damages, claiming that Harvey was not an accident or true “act of God” and that the insured parties contributed to the damage both by failing to take adequate precautions and by contributing to climate change themselves.