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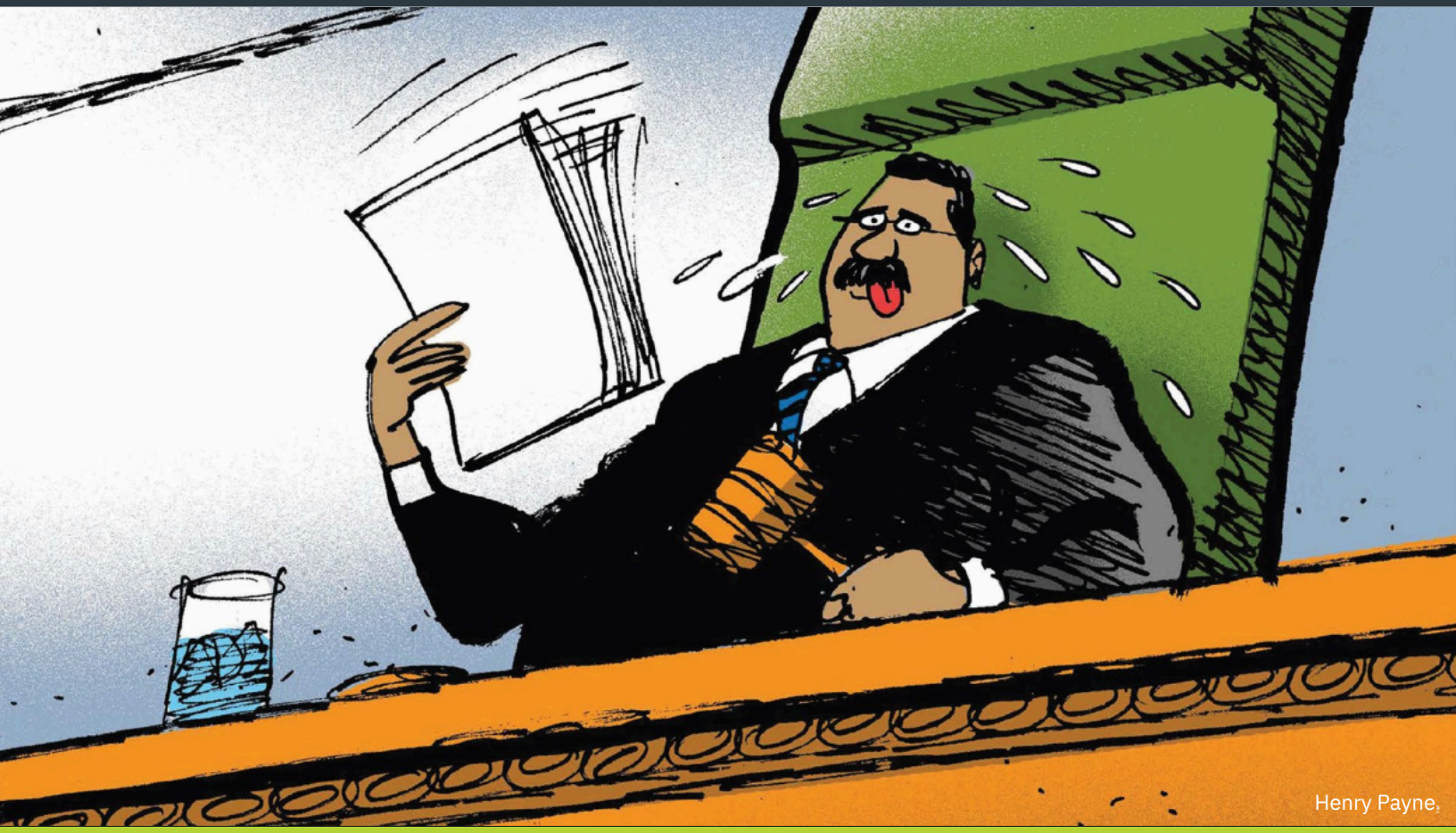
CLIMATE SCIENCE AND LAW FOR JUDGES

Overview of Climate Litigation



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Overview of Climate Litigation

by Sandra Nichols Thiam and Jarryd C. Page

This module presents an overview of climate litigation both domestically and globally, but its focus is on what is happening in the United States and how climate science arises in both federal and state cases. Part One describes the scope of current climate litigation and trends in the types of cases, litigants, and arguments. Part Two outlines the varieties of claims, defenses, and remedies frequently presented in climate litigation. Part Three focuses on when and how the science of climate change enters the courtroom, including what kind of scientific evidence may come before judges.

Table of Contents

I. Scope of and Trends in Climate Litigation

This part explains some of the various types of climate litigation, provides examples, and reports on the number of climate cases and the continuing increase in climate cases in the United States and around the world.

A. Scope

1. What Is Climate Change Litigation?

Climate change litigation can relate to the reduction of greenhouse gas (GHG) emissions or other causes of climate change ("mitigation"), actions taken in response to climate change effects ("adaptation"), or damages from climate impacts. These categories are often fluid.

Box 1. Locating Information on Climate Cases

Established in 2007, Columbia Law School's Sabin Center for Climate Change Law along with the law firm Arnold & Porter maintains the definitive climate litigation tracker, the Climate Litigation Database (Sabin Database). The database is searchable and can be filtered by topic and/or jurisdiction, making it the single best place to find information about climate cases. Access the Sabin Database at http://climatecasechart.com/.

Mitigation cases center on efforts to reduce or control GHG emissions. This litigation includes attempts to force various governments to take action with respect to climate change mitigation and claims to stop or slow fossil fuel-based projects, such as environmental review of or permitting challenges to coal-fired power plants, natural gas development, oil and natural gas pipelines, and other associated infrastructure. Also in this category are cases about carbon sequestration, which includes both efforts to retain capacity to absorb carbon dioxide (CO_2) in natural places such as forests and wetlands, and negative emissions technologies such as carbon capture and storage. Mitigation cases also include disputes related to the transition to renewable energy sources. Issues are coming to the courts related to the siting, impact assessments, and approvals of wind and solar projects, as well as issues surrounding electricity transmission, including attempts to stop or delay the building of these new facilities.

Adaptation cases involve requests to force adaptation actions, claims of inadequate adaptation, and claims seeking funding for adaptation.[1] Some of the earliest cases in this category involved suits by Native Alaskans and other Native Americans seeking funds to move their communities when climate change impacts made their traditional homes untenable.[2] More recent illustrative suits have been filed in Massachusetts, Connecticut, and elsewhere in the Northeast, alleging that companies with coastal facilities failed to properly prepare against the known and projected impacts of sea-level rise and flooding in stormwater management plans. In those cases, plaintiffs relied on reports from the Intergovernmental Panel on Climate Change (IPCC), national and state climate assessments,

[1] *See* Jacqueline Peel & Hari M. Osofsky, *Sue to Adapt?*, 99 MINN. L. REV. 2177 (2015), https://scholarship.law.umn.edu/mlr/278/.
[2] *See* Native Vill. of Kivalina v. ExxonMobil Corp., 663 F. Supp. 2d 863, 880-82 (N.D. Cal. 2009), *aff'd*, 696 F.3d 849 (9th Cir. 2012).

Federal Emergency Management Agency (FEMA) flood maps, and peer-reviewed studies of regional and site-specific impacts.[3]

Perhaps the broadest range of cases relate to damages and other harms from climate impacts, including impacts on public health as well as to public and private property and natural resources, from heat waves, sea-level rise, drought, wildfires, and extreme storms. Some of these impacts will result in legal disputes, and will require judges to determine who, if anyone, bears responsibility for the damages and what remedies are available. Accordingly, judges will be front and center in answering these questions as climate impacts become more frequent and intense and climate science advances to allow attribution of impacts to climate change.

While all of these examples might be considered "climate litigation," the degree to which issues about the scientific aspects of climate and climate change are raised in a given case will vary.

2. How Many Cases Are There?

As of August 2025, the Sabin Database (see Box 1) included more than 3,100 climate cases, with two-thirds of those in the United States (see Figure 1).

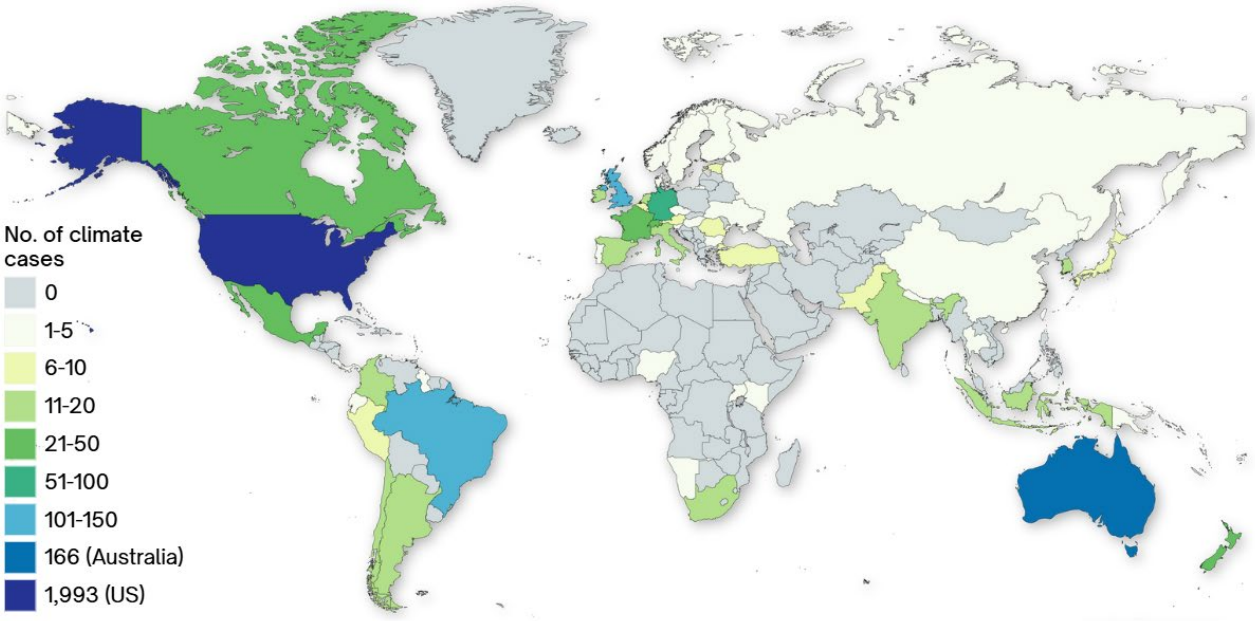

Figure 1. Map showing number of climate cases by country. Based on data from the Sabin Database, compiled August 2025.

[3] *See, e.g.,* Conservation L. Found. v. ExxonMobil Corp., No. 16-11950 (D. Mass.) (settled); Conservation L. Found. v. Shell Oil Prods., No. 17-00396 (D.R.I. May 29, 2025) (responding to discovery motions); Conservation L. Found. v. Shell Oil Co., No. 21-00933 (D. Conn. June 13, 2025) (denying motion to stay proceedings); *see also* JACOB ELKIN, CLIMATE SCIENCE IN ADAPTATION LITIGATION IN THE U.S. 39-45 (Aug. 2022), https://scholarship.law.columbia.edu/sabin_climate_change/192/.

According to the Sabin Database, approximately 45% of climate cases in the United States (approximately 850) have been filed in state courts; the rest have been filed in federal courts. While the vast majority of claims relate to mitigation, there are at least 180 cases in U.S. courts related to adaptation. The state with the most climate cases by far is California, unsurprisingly given its population, the scope of recent impacts there, the state's environmental review law, the California Environmental Quality Act (CEQA), and other facets of California law, such as its consumer protection statutes.

Cases that feature climate as a central issue are catalogued in the Sabin Database. To be included there, a case must: (1) be before a judicial body, and (2) feature climate science, policy, or law as a material issue of fact or law. The Database acknowledges that because of data collection and definitional limitations, it does not capture all disputes related to climate change.

This relatively narrow definition excludes many disputes where climate is distinctly relevant but may be a secondary issue, a motivating factor, or provide contextual information. For example, local air pollution challenges or certain challenges related to fossil-fuel infrastructure that have climate-related consequences but do not explicitly raise climate issues are not counted. In addition, many cases related to weather and climate impacts, including insurance and utility-related cases, are similarly not included. (A single hurricane or wildfire can generate thousands of insurance claims.)

Figure 2 illustrates how climate may be involved to a greater or lesser degree in many types of litigation. While not all of these rings are captured by Sabin's database (which focuses on the innermost ring), they might still fairly be characterized as climate litigation. Judges hearing cases that raise issues in any of these circles will be best equipped if they have a grounding and understanding of when climate science might play a role in a dispute, and how to properly assess the use of that science when it comes up.

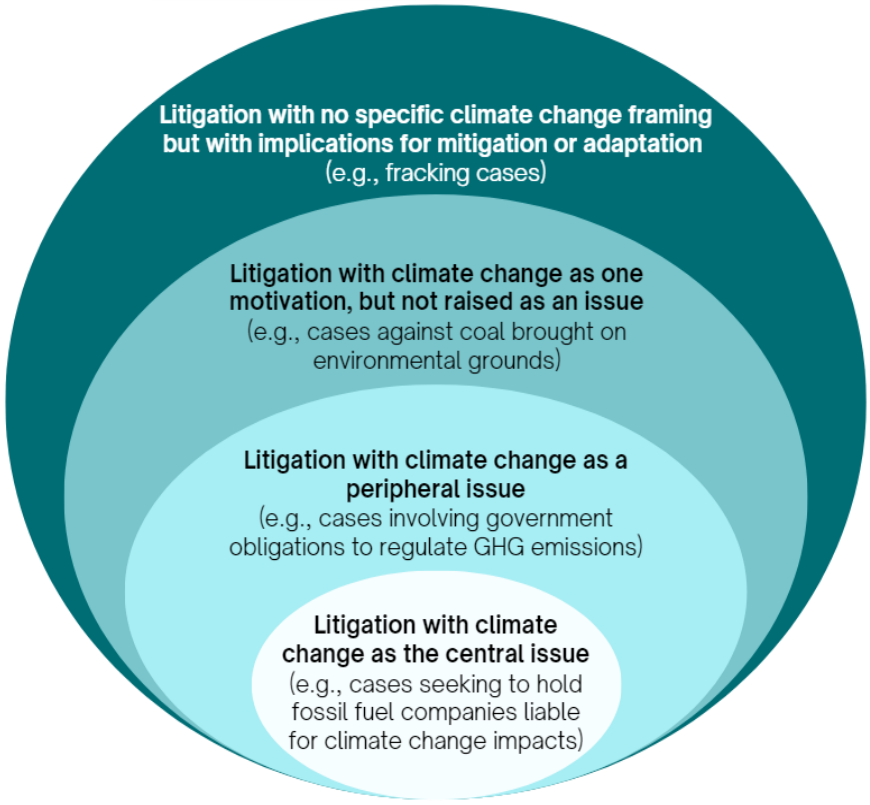

Figure 2. Concentric circle diagram of climate litigation. Adapted from Jacqueline Peel & Hari M. Osofsky, *Climate Change Litigation*, 16 ANN. REV. OF L. & SOC. SCI. 8.4 (2020) (Figure 1).

B. Trends

The number of climate cases has steadily increased in the last 20 years (see Figure 3). For example, fewer than 20 cases were filed around the world in 2005. By 2015, that number eclipsed 100 (with 112 cases filed), and at least 150 cases have been filed each year since 2017, with several years exceeding 200 cases filed each year. To date, more than 275 cases have reached a jurisdiction's highest court, such as supreme courts and constitutional courts, including more than 115 in the United States.[4]

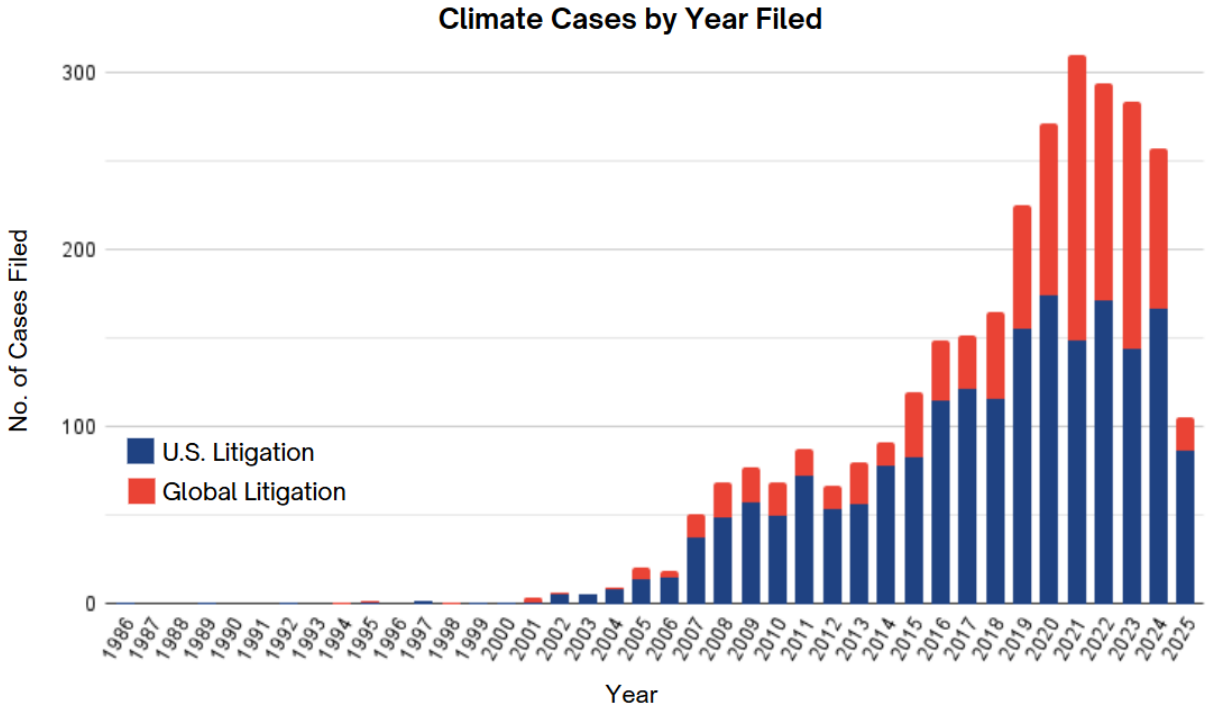

Figure 3. Chart showing growth of climate cases. Based on data from the Sabin Database, compiled August 2025.

The current trajectory of filings is expected to continue, given more frequent and intense climate and weather events, the enactment of climate-related laws and regulations, and more exacting climate science that is continually being refined and made more robust.

This increase in climate cases is in many ways a result of the increasing ability of scientists to provide answers to questions about climate-related phenomena and their impacts—as our factual knowledge about the science increases, so do the legal implications. The IPCC's Sixth Assessment Report (AR6) on mitigation concludes that climate litigation is growing and can affect climate governance.[5] The

[4] JOANA SETZER & CATHERINE HIGHAM, GLOBAL TRENDS IN CLIMATE CHANGE LITIGATION 21 (June 2025), *available at* https://www.lse.ac.uk/granthaminstitute/publication/global-trends-in-climate-change-litigation-2025-snapshot/ [hereinafter SETZER & HIGHAM, 2025 SNAPSHOT].

[5] Navroz K. Dubash & Catherine Mitchell, *National and Sub-National Policies and Institutions, in* IPCC, CLIMATE CHANGE 2022: MITIGATION OF CLIMATE CHANGE 13-29 (2022).

U.S. Fifth National Climate Assessment similarly notes that litigation plays a role in climate governance in the United States.[6]

1. United States

The breadth of legal theories pursued by plaintiffs in U.S. climate cases is remarkable (see Figure 4). These include a wide variety of federal and state constitutional, statutory and regulatory, and common-law claims. The most common statutory claims are those challenging environmental reviews under the National Environmental Policy Act (NEPA) and state-law equivalents.

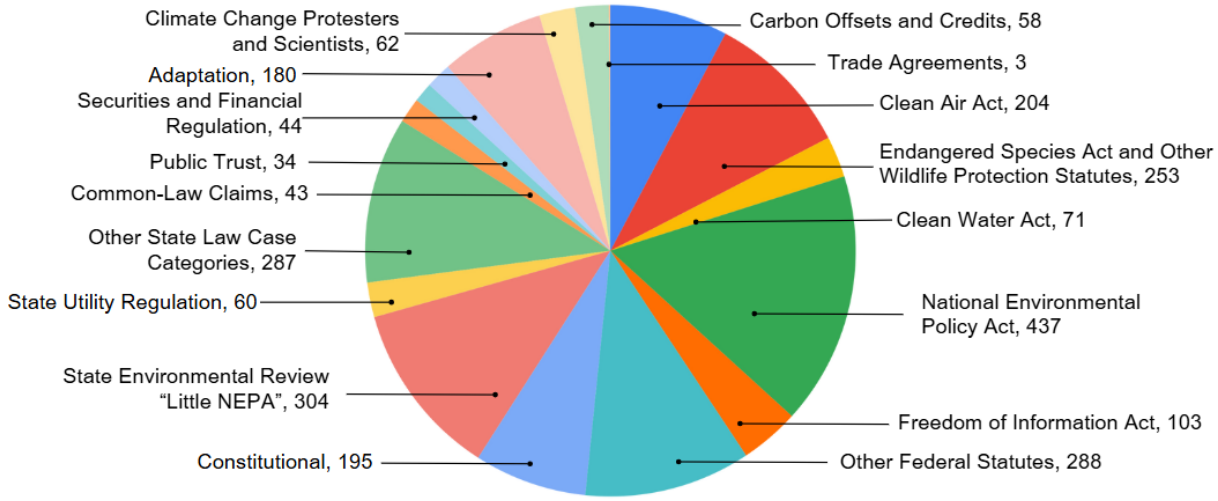

Figure 4. Chart showing breadth and number of climate claims. Based on data from the Sabin Database, compiled August 2025. *Note*: Some cases fall into more than one category.

Climate litigation involves parties from all levels of government—federal, state, tribal, and local; nongovernmental organizations (NGOs); industry and trade associations; and individuals. Litigants seeking to advance climate protections significantly outnumber litigants trying to undermine climate protections, but there are significant, broadly impactful examples of each type of case. NGOs and individuals, as well as subnational (state, county, local) governments, are the most frequent plaintiffs in climate lawsuits; while governments and federal agencies, such as the U.S. Environmental Protection Agency (EPA) and the U.S. Department of the Interior (DOI), have been the most frequent defendants.

Trending categories of climate litigation include[7]:

- *Domestic enforcement cases* involving disputes over whether a private party complied with applicable standards, such as for emissions from a coal-fired power plant;
- *Government action cases*, including claims made under NEPA and state equivalents or wildlife laws like the Endangered Species Act (ESA), trying to compel agencies to adequately

[6] U.S. GLOBAL CHANGE RESEARCH PROGRAM, FIFTH NATIONAL CLIMATE ASSESSMENT (2023).
[7] *See* UNEP & Sabin Center for Climate Change Law, GLOBAL CLIMATE LITIGATION REPORT: 2023 STATUS REVIEW 42-60 (2023) [hereinafter UNEP, 2023 STATUS REVIEW]. *See also* SETZER & HIGHAM, 2025 SNAPSHOT, *supra* note 4.

account for and analyze climate impacts in their decisionmaking. These cases often involve environmental impact reviews, and allegations that an agency did not (or did not properly) account for climate impacts; or alternatively, that those impacts, such as the increased chances of a drought or sea-level rise, make siting or development of a specific project uneconomical or potentially unsafe. Cases involving permits associated with these types of projects are also in this category.

- *Climate rights cases* involving claims that governmental policies and practices violate constitutional rights to due process, equal protection, or in some instances, an express or implied right to a clean and healthy environment. With rare exceptions, the U.S. cases in this category are being filed in state courts, based on state constitutions. International cases in this category tend to be guided by human rights frameworks or other international law.
- *"Failure to adapt" claims*, alleging the defendant did not take appropriate action to guard against the known impacts of climate change, such as a wastewater or other industrial facility sited along the coast that is vulnerable to rising seas.
- *Corporate liability claims* that arise from extreme events, as with Houston's Hurricane Harvey; or from ongoing behavior, as with claims by cities and states that oil companies are liable for damage that resulted from the use of their product. The status of these cases is covered below in Part II.B (Jurisdiction) and Part II.C.3 (Common Law).
- *Greenwashing claims* that allege a practice of falsely labeling a product as sustainable or climate-friendly, when the product's makeup or company practice undermines those claims.

Outside these categories, insurance cases warrant special mention because although insurance claims are not necessarily captured in the Sabin Database, insurance litigation in the wake of extreme weather and climate events is becoming more and more common. For instance, thousands of insurance claims followed Hawaii's 2023 Lahaina wildfires, leading to a subsequent $4 billion settlement.[8] Insurance company calculations around climate risk are evolving too. Companies are starting to pull coverage in certain high-risk zones, including in areas in California subject to wildfire hazards, and places in Florida at risk for hurricanes.[9] In addition, insurance companies have filed attention-getting climate adaptation cases of their own, alleging that cities have failed to adequately prepare for climate change impacts, increasing the need for payouts.[10] Finally, at the federal level, the future of the insolvent National Flood Insurance Program (NFIP) remains in some doubt, and changes to the program could drive future climate litigation from stranded homeowners.

These categories of claims are likely to continue to expand in scope and scale in the future, particularly in light of fluctuating commitments from governments and the private sector to address climate change and accelerating economic drivers supporting a transition to renewable energy generation.

Judicial decisions are also likely to guide future developments. For example, a series of decisions one way or the other on youth climate rights claims, or on claims by cities and states against oil

[8] Stewart Yerton, *Judge: All Maui Wildfire Insurance Claims Must Be Made Public*, Honolulu Civil Beat (Nov. 7, 2024), https://www.civilbeat.org/2024/11/judge-all-maui-wildfire-insurance-claims-must-be-made-public/.
[9] Mira Rojanasakul & Christopher Flavelle, *See Where Home Insurance Policies Were Dropped in Your State*, N.Y. TIMES (Dec. 18, 2024), https://www.nytimes.com/interactive/2024/12/18/climate/insurance-nonrenewal-rates-policies-state-map.html.
[10] *See, e.g.*, Ill. Farmers Ins. Co. v. Metro. Water Reclamation Dist. of Greater Chicago, No. 14-03251 (N.D. Ill. June 3, 2014) (voluntarily dismissing claims).

companies, could precipitate and serve as precedent for similar claims across the country. Judicial decisions related to the foreseeability of impacts could contribute to establishing related legal duties for corporations or government entities.

2. International

Climate litigation is not confined to the United States, and it is becoming more common across the globe (see Figures 2 and 3). The current number of climate cases globally is roughly half the total number of U.S. cases. After the United States, the greatest number of climate cases are in Australia, Brazil, and the United Kingdom. Decisions from international tribunals, such as the International Court of Justice or Inter-American Court of Human Rights on the roles and responsibilities of states with respect to climate change under international law, may shape future directions of litigation.[11]

One 2019 study of more than 250 non-U.S. climate cases found that the majority of them (77%) engaged with climate change "peripherally," in the course of dealing with human and constitutional rights, disaster management, environmental protection, and other issues.[12] However, this may be changing as an increasing number of national and international tribunals have brought climate more centrally into the conversation by recognizing the right to a stable climate as a fundamental human right protected under multiple human rights laws and treaties, including the Convention on the Rights of the Child.

Many U.S. trends in climate litigation are present in other jurisdictions as well. For example, rights-based litigation is similarly apparent across the globe (see Box 2). One notable instance is the inquiry by the Human Rights Commission of the Philippines, finding that the world's largest oil companies, including BP, Shell, and Chevron, knew about the dangers of climate change and obscured them, and declaring that the companies may need to provide remediation for human rights violations.[13] Although quasi-judicial, the inquiry's findings are historic as one of the first investigative bodies to examine the role of oil companies in climate change.

Box 2. Trend Highlight: Rights-Based Theories

Rights-based theories are a major trend in international climate cases. Examples include the decisions in *Leghari v. Pakistan* (2015) W.P. No. 25501/2015 (Pak.)—which found that the Pakistani government failed to adequately respond to the nation's Climate Framework, thereby violating the plaintiff's constitutional rights "to life, human dignity, property, and information"—and *Urgenda*—a decision, upheld by the Supreme Court of the Netherlands, holding that the European Convention on Human Rights, as adopted by Dutch law, imposes obligations on the government to reduce emissions and limit warming. U.S. Hof's-Gravenhage 09 Oktober 2018, Case No. 200.178.245/01 (Urgenda Foundation/State of the Netherlands) (Neth.).

Similar cases have been filed in Australia, Austria, Belgium, Canada, Colombia, India, Japan, Norway, the Philippines, South Africa, South Korea, and Switzerland.

[11] Maria Antonia Tigre et al., Sabin Ctr. for Climate Change L., *The ICJ's Advisory Opinion on Climate Change: An Introduction*, CLIMATE L. (July 24, 2025), https://blogs.law.columbia.edu/climatechange/2025/07/24/the-icjs-advisory-opinion-on-climate-change-an-introduction/.

[12] Jacqueline Peel & Jolene Lin, *Transnational Climate Litigation: The Contribution of the Global South*, 113 AM. J. INT'L L. 679, 683 (2019).

[13] COMM'N ON HUMAN RIGHTS OF THE PHILIPPINES, NATIONAL INQUIRY ON CLIMATE CHANGE REPORT (2022), https://chr.gov.ph/wp-content/uploads/2022/05/CHRP-NICC-Report-2022.pdf.

While the majority of climate litigation thus far has been in the Global North, the geographic diversity of filings is expanding. Specifically, there has been an increase in climate litigation taking place in the Global South, nationally and transnationally.[14]

The emergence of climate cases in the Global South can be tied to a number of factors, including more laws and resources being devoted to mitigation, adaptation, and other aspects of sustainable development; relaxed standing requirements; commitments made pursuant to international instruments like the Paris Agreement; and increased capacity of capable lawyers who can argue a suite of tested climate litigation theories.

In one transnational case, Saúl Luciano Lliuya, a Peruvian farmer and mountain guide whose home is threatened by melting glaciers, brought suit in a German court against RWE, a German electricity company. Lliuya sought €17,000 (approx. $20,000) to pay for measures to protect his home from flooding and mudslides, an amount he claimed was equivalent to the historical global share of RWE's emissions. A German appeals court considered evidence related to RWE's contribution of GHG emissions, as well as climate science estimating the threat of flooding from the glacial lake.[15] Following a visit to the site in Peru by the judges, attorneys, and court-appointed experts, the court dismissed the case, finding that the plaintiff had not demonstrated a sufficiently imminent or acute threat to his property. Notably, the court concluded that RWE could be found liable for climate-related damages if the risk were proven to be higher.[16]

Many of these cases and issues are explored further in the Overview of European Climate Litigation.

II. Legal Landscape of Climate Litigation

Federal and state courts typically encounter a "climate case" in circumstances that do not differ markedly from other cases (see Box 3). While some high-profile climate cases involve novel legal theories, the vast majority rely on common-law, statutory, and administrative law doctrines. This part explores the parties involved in climate litigation, identifies jurisdictional and procedural issues, and details the types of claims and defenses presented and remedies sought. While focused on the U.S. context, international examples are referenced when applicable.

Box 3. What's a Typical Climate Case?

There is no typical climate case, claim, defense, or remedy, and there is no template for how climate issues are raised in litigation.

Rather, climate change is a cross-cutting issue that can arise either as the centerpiece of a case or as an ancillary feature. In the United States, climate cases implicate a wide variety of procedural and substantive legal issues, involving constitutional, statutory, administrative, and common-law doctrines.

[14] Peel & Lin, *supra* note 12.
[15] Luciano Lliuya v. RWE AG, https://climatecasechart.com/non-us-case/lliuya-v-rwe-ag/; Sandra Nichols Thiam et al., *Weathering the Storm of Global Climate Litigation: Enabling Judges to Make Sense of Science*, 54 GEO. J. INT'L L. 563, 586-90 (2023).
[16] Dara Albrecht, *No Liability, Yet? What* Lliuya v. RWE A.G. *Means for Transnational Climate Litigation*, ELI VIBRANT ENVIRONMENT (June 18, 2025), https://www.eli.org/vibrant-environment-blog/no-liability-yet-what-lliuya-v-rwe-ag-means-transnational-climate.

A. Parties

The parties involved in climate litigation are wide-ranging.

The *federal government*, generally through its administrative agencies, has frequently been in court defending climate challenges centered on regulatory action or inaction. EPA and DOI are the most common federal defendants in climate cases. In a novel and widely publicized case, *Juliana v. United States*, youth plaintiffs asserted that the entire federal government violated their constitutional rights to due process, equal protection, and unenumerated rights; they joined as defendants officials from the Council on Environmental Quality, the Office of Management and Budget, the Office of Science and Technology Policy, EPA, and the Secretaries of Energy, DOI, Transportation, Agriculture, Commerce, Defense, and State.[17] That case is discussed in greater detail below.

State governments have been on both sides of climate cases. Climate-related suits filed by Connecticut against power companies are an early example of states acting as plaintiffs.[18] Since then, California, Connecticut, Delaware, Hawaii, Maine, Minnesota, New Jersey, Rhode Island, and Vermont have filed suits against fossil-fuel companies.[19] Many local governments, including cities and counties as well as tribal governments, have brought similar suits, including a class action suit by municipalities in Puerto Rico. Legal observers have frequently drawn parallels between these suits and tobacco-related litigation in the 1990s.[20]

States have been defendants in climate cases as well. Washington, for example, was sued by youth citizens who alleged the state created and supported a "fossil fuel-based energy and transportation system" that violated Washington's state constitution and the public trust. The Washington trial court and appellate panel did not agree, reasoning that a judicial extension of that state's public trust doctrine to air resources would violate separation-of-powers principles.[21] Similar cases have been filed in multiple states, with the plaintiffs often represented by Our Children's Trust, a nonprofit public interest firm that says it is pursuing a 50-state strategy to advance climate action (the firm also represented the plaintiffs in *Juliana*).[22]

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[17] First Amended Complaint, Juliana v. United States, No. 15-01517 (D. Or. Sept. 10, 2015).

[18] *See infra* notes 34-35 and accompanying text.

[19] *See* complaints in State of Hawaii v. B.P. P.L.C., No. 1CCV-25-0000717 (Haw. Cir. Ct. May 1, 2025); State of Maine v. BP P.L.C., No. PORSC-CV24-442 (Me. Super. Ct. Nov. 26, 2024); The People of the State of California v. Exxon Mobil Corp., No. CGC23609134 (Cal. Super. Ct. Sept. 23, 2023); State of Vermont v. Exxon Mobil Corp., No. 21-CV-02778 (Vt. Super. Ct. Sept. 14, 2021); State of Connecticut v. Exxon Mobil Corp., No. HHDCV206132568S (Conn. Super. Ct. Sept. 14, 2020); State of Delaware v. BP America Inc., No. N20C-09-097 (Del. Super. Ct. Sept. 10, 2020); State of Minnesota v. Am. Petroleum Inst., No. 62-CV-20-3837 (Dist. Ct. 2d Jud. Dist. Minn. June 24, 2020) (including ExxonMobil); Platkin v. Exxon Mobil Corp., No. MER-L-001797-22 (N.J. Super. Ct. Oct. 18, 2022); State of Rhode Island v. Chevron Corp., No. PC-2018-4716 (R.I. Super. Ct. July 2, 2018).

[20] *See, e.g.*, Lisa Benjamin & Alexandra Guillot, British Inst. of Int'l Comparative L., GLOBAL PERSPECTIVES ON CORPORATE CLIMATE LEGAL TACTICS: UNITED STATES OF AMERICA NATIONAL REPORT (2024); Natasha Geiling, City of Oakland v. BP*: Testing the Limits of Climate Science in Climate Litigation*, 46 ECOLOGY L.Q. 683, 683 (2019). Comparisons have also been made with chemical exposure litigation. Sabrina McCormick et al., *Science in Litigation: The Third Branch of U.S. Climate Policy*, 357 SCI. 979, 980 (Sept. 2017).

[21] Aji P. v. State of Washington, No. 80007-8-I (Wash. Ct. App. Feb. 8, 2021), *cert. denied*, No. 99564-8 (Wash. Oct. 6, 2021).

[22] Our Children's Trust, *State Legal Actions*, https://www.ourchildrenstrust.org/state-legal-actions (last visited Sept. 2, 2025).

Nongovernmental organizations are involved in a high percentage of climate cases, at times partnering with a local client or clients. This includes environmental groups as well as industry trade groups, although environmental NGOs appear significantly more often.

Corporations also appear in climate cases. They often include companies that have a role in the production, transportation, and refining, as well as the promotion and marketing, of fossil fuels. Corporation parties can also include insurance companies and companies that have a role in the renewable energy transition.

Last, *individuals* and groups of individuals appear in climate litigation, commonly as plaintiffs in cases against government entities. As noted above, in the United States, many of these cases are brought by youth (represented by Our Children's Trust or other NGOs) who assert that activities and directives of the state or federal governments related to fossil fuel extraction and consumption have resulted in violations of their federal or state constitutional rights. Several have been dismissed on justiciability and procedural grounds,[23] although one challenge in Montana proceeded to trial and was affirmed by the Montana Supreme Court (see *Held v. Montana* in Part II.C.1 below). A Hawaii case, filed against the Hawaii Department of Transportation (HDOT) and focused on reducing emissions from the transportation sector, reached a settlement that requires HDOT to reduce air, land, and sea transportation emissions to net zero by 2045.[24]

B. Threshold Legal Questions

To date, courts considering climate cases have needed to tackle threshold legal issues, most frequently standing, the political question doctrine, separation of powers, and jurisdiction. Many courts have considered whether federal court or state court is the appropriate forum to hear plaintiffs' claims.

Standing. In the United States, standing has been a principal issue in climate litigation because, at least in federal court, plaintiffs must show (1) they have suffered a concrete and particularized injury that (2) was caused by the defendant, and that (3) the court can potentially redress with a favorable ruling. State courts often follow a similar formula, but not always. For example, Connecticut law provides broad standing for nearly anyone to bring a claim about environmental issues in state courts.[25]

As discussed in the Procedural Techniques module, standing analysis will vary from case to case, depending on what exactly the plaintiff is alleging and what relief she is seeking. Plaintiffs seeking injunctive relief to compel government defendants to act to address climate change have at times failed on grounds that the claims are too general or are not capable of redress by the court,[26] while plaintiffs seeking declaratory relief or vacatur of a specific policy have more readily been able to

[23] *See, e.g.,* Reynolds v. State of Florida, No. 1D20-2036 (Fla. May 18, 2021); *Aji P.*, No. 80007-8-I (Wash. Ct. App. Feb. 8, 2021); Sinnok v. State of Alaska, No. 3AN-17-09910 (Alaska 2018); *see also* Sagoonick v. State of Alaska, 503 P.3d 777 (Alaska 2022).

[24] Navahine F. v. Dep't of Transportation, State of Hawai'i, No. 1CCV-22-0000631 (Cir. Ct. 1st Cir. Haw. June 20, 2024).

[25] CT. GEN. STAT. §22a-16.

[26] *See, e.g.*, Clean Air Council v. United States, 362 F. Supp. 3d 237, 246-47, 249-50 (E.D. Pa. 2019); Juliana v. United States, 947 F.3d 1159, 1170-71 (9th Cir. 2020).

demonstrate standing. Tort plaintiffs seeking money damages have been less likely to face substantial obstacles to standing.

Political question. The political question doctrine and separation-of-powers principles have also played a role in determining the justiciability of climate cases. As articulated by the U.S. Supreme Court, "political question" is a function of the separation of powers, applicable when the Court determines that resolution of an issue is committed to a specific governmental branch by the U.S. Constitution. While some federal district courts have ruled that climate-related claims present non-justiciable political questions,[27] the Courts of Appeals have so far tended to reverse those decisions.[28] State courts have also invoked analogous doctrines when dismissing all or portions of some youth climate suits.[29]

Jurisdiction. Climate cases are filed in federal and state courts across the country. In most cases, jurisdiction is not contested. For example, claims that a federal agency failed to list a species as threatened or endangered under the ESA because of climate change undeniably arise under a federal statute, and thus can be filed in federal court. Challenges to state permitting authorities for failure to consider a project's climate impacts fall squarely within state court jurisdiction.

However, in the high-profile cases filed by state and local governments against fossil fuel companies, jurisdiction has been hotly contested. The U.S. Supreme Court's 2011 decision in *Connecticut v. American Electric Power* has shaped this line of cases. *AEP* held that "any federal common-law right to seek abatement of carbon-dioxide emissions from fossil-fuel fired power plants" is displaced by the federal Clean Air Act (CAA).[30] This decision, therefore, foreclosed a federal court path for many plaintiffs who were pursuing *federal* common-law tort claims related to impacts from GHG emissions.

[27] *See* Connecticut v. Am. Elec. Power Co., 406 F.2d 265, 274 (S.D.N.Y. 2005); Comer v. Murphy Oil USA, No. 05-436, *1 (S.D. Miss. Aug. 30, 2007); *Kivalina*, 663 F. Supp. 2d at 868.
[28] *See, e.g.*, Connecticut v. Am. Elec. Power, Inc., 582 F.3d 309, 321-32 (2d Cir. 2009); Comer v. Murphy Oil USA, 585 F.3d 855, 869-76 (5th Cir. 2009).
[29] *See* Held v. State of Montana, No. CDV-2020-307 7, 19 (Mont. Aug. 4, 2021) (finding request to order executive or legislative branch to create a remedial plan is a political question and thus nonjusticiable); Reynolds v. State of Florida, No. 1D20-2036 (Fla. May 18, 2021); Sagoonick v. State, 503 P.3d 777, 2022 WL 262268 (Alaska 2022).
[30] 564 U.S. at 410, 411 (2011).

In response, these plaintiffs began to bring *state* common-law claims in state courts under theories of public nuisance, fraud, trespass, consumer protection, and deceptive marketing. These cases have followed a predictable playbook, ping-ponging between state and federal court (see Figure 5). The jurisdictional issue has now largely been resolved, with federal appellate courts uniformly concluding that state courts are the proper place, and the U.S. Supreme Court denying review of those decisions.[31] Although the jurisdictional question in these cases appears settled, the merits remain unresolved. Defendants have filed motions to dismiss arguing, among other things, that plaintiffs' state-law claims are preempted by federal law. A number of these cases are now proceeding through motions practice and discovery in the state courts where they were filed. For more on the merits issues related to these cases, see Part II.C.3 (Common Law).

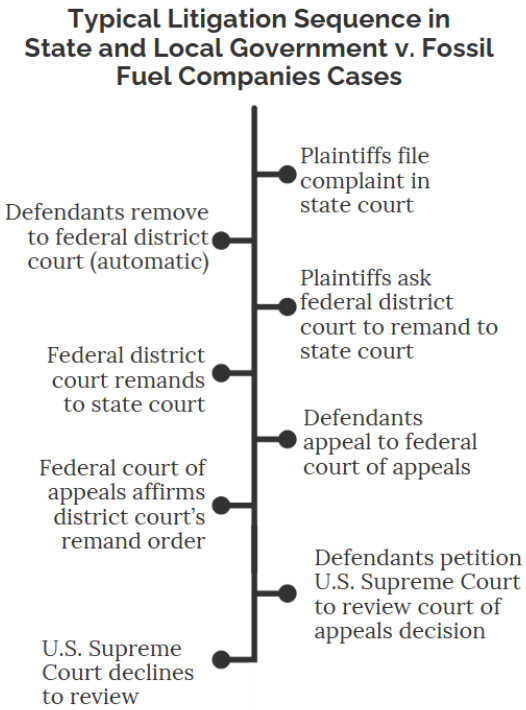

Figure 5. Typical procedural sequence in subset of climate cases.

In addition to standing, political question, and jurisdictional issues, climate cases can present other procedural and case management issues, including class action certification, multidistrict litigation, alternative dispute resolution, complex discovery, and admissibility hearings, as well as the role of independent experts, court-appointed neutrals, intervenors, and amici. See Procedural Techniques for a more detailed discussion of these and related topics.

C. Claims and Legal Theories

The breadth of legal theories pursued by plaintiffs is remarkable (see Figure 4) and makes simple categorization difficult. Generally, these include a wide variety of federal and state constitutional, statutory and regulatory, and common-law claims. Cases may (and often do) include claims from more than one category (see Box 3).

1. Constitutional and Rights-Based Claims

In the United States, climate litigation has been brought based on the Commerce, Takings, Due Process, and Equal Protection Clauses of the federal constitution, among other provisions. For example, the Fifth Amendment's Takings Clause can arise in the coastal property context. In *Lucas v. South Carolina Coastal Council*, the Supreme Court found that a state ban on construction on a South

[31] *See, e.g.,* Cty. of San Mateo v. Chevron Corp., 32 F.4th 733 (9th Cir. 2022), *cert. denied*, No. 22-495, 143 S. Ct. 1797 (2023); Bd. of Cty. Comm'rs of Boulder Cty. v. Suncor Energy, 25 F.4th 1238 (10th Cir. 2022), *cert. denied*, No. 21-1550, 143 S. Ct. 1795 (2023); Rhode Island v. Shell, 35 F.4th 44 (1st Cir. 2022), *cert. denied*, No. 22-524, 143 S. Ct. 1796 (2023); City of Hoboken v. Chevron Corp., 45 F.4th 699 (3d Cir. 2022), *cert. denied*, No. 22-821, 143 S. Ct. 2483 (2023).

Carolina barrier island had deprived the owner of all economically viable use of land, amounting to a compensable taking.[32]

While not at the time explicitly about climate change, the issues raised in *Lucas* illustrate the intersection between private-property rights and bans on development or other adaptation measures in areas vulnerable to sea-level rise and coastal flooding in coastal jurisdictions throughout the United States. This case, and other issues related to sea-level rise, are covered in Sea-Level Rise.

Climate rights cases more commonly involve claims that the impacts of climate change are interfering with the right to life, liberty, property, due process, and in some jurisdictions an express right to a clean and healthy environment. These claims are often paired with public trust arguments that establish a duty for the state to conserve common resources for present and future generations. While in the United States rights-based cases are not the greatest in number, they tend to seek bold remedies and have the potential to alter the climate litigation landscape by catalyzing similar lawsuits.

In the United States, these cases have been brought primarily in state courts. However, one well-known example, *Juliana v. United States*, was filed in 2015 in federal court and serves as a prime example of a climate suit raising fundamental rights claims under the U.S. Constitution.[33] The U.S. Court of Appeals for the Ninth Circuit twice dismissed the case (in 2020 and 2024), with it coming to a complete end in 2025 after the Supreme Court denied review. Despite the eventual dismissal for lack of redressability, the Ninth Circuit panel did note that "at least some of the plaintiffs have presented evidence that climate change is affecting them now in concrete ways and will continue to do so unless checked," and that "[t]he causal chain here is sufficiently established."[34] (For more about *Juliana*, see Part II.D on Remedies).

In contrast with the federal Constitution, seven state constitutions have provisions that explicitly provide a right to a clean and healthy environment, although the language in these Environmental Rights Amendments (ERAs) varies from state to state.[35] New York's, for example, states that "[e]ach person shall have a right to clean air and water, and to a healthful environment."[36] Pennsylvania's ERA,[37] among the earliest to be adopted and the most-cited, has been a source of litigation related to the state legislature's enactment of oil and gas laws that were found to have violated the state's trust responsibility.[38]

Montana's ERA was central to *Held v. Montana*, the first climate rights case to go to trial in the United States. In *Held*, a Montana trial court declared that portions of a Montana law that barred state agency officials from considering climate impacts and GHG emissions when conducting

[32] Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).
[33] First Amended Compl., Juliana v. United States, No. 15-01517 (D. Or. Sept. 10, 2015).
[34] Juliana v. United States, 947 F.3d 1159, 1168-69 (9th Cir. 2020). Following the Ninth Circuit's 2020 dismissal, the district court allowed plaintiffs to amend their complaint to include exclusively declaratory relief, but the Ninth Circuit again ordered dismissal. In re United States, No. 24-684, 2024 WL 5102489 (9th Cir. May 1, 2024), *cert. denied sub nom.* Juliana v. United States, No. 24-645, 145 S. Ct. 1428 (2025).
[35] These are Illinois, Pennsylvania, Montana, Massachusetts, Hawai'i, Rhode Island, and New York.
[36] N.Y. CONST., Art. I, §19.
[37] PA. CONST., Art. I, §27.
[38] Robinson Township v. Commonwealth of Pennsylvania, 83 A.3d 901 (Pa. 2013).

environmental reviews violated the youth-plaintiffs' state constitutional right to a "clean and healthful environment."[39]

The *Held* trial featured extensive testimony from climate scientists about the causes of climate change, its impacts in Montana and on the plaintiffs, Montana's GHG contributions, and the climate solutions the state could pursue to reduce its emissions.[40] The state district court's 103-page opinion contained nearly 1,000 references to that testimony, and found that the youth plaintiffs' constitutional right to a "clean and healthful environment" includes the right to a stable climate.[41] The Montana Supreme Court affirmed the decision in December 2024.[42]

Constitutional and rights-based challenges are not confined to the United States, and are an increasingly significant trend worldwide (see Part I.B.2). In *Leghari v. Pakistan* the court found that a farmer's rights under Pakistan's Constitution were violated when the Pakistani government failed to sufficiently prioritize a national response to climate change (see Box 2).[43] Germany's Federal Constitutional Court, the country's highest, found that the German climate law's failure to provide a sufficient long-term plan for reducing carbon emissions violated youth plaintiffs' fundamental rights enshrined in a constitutional provision designed to protect current and future generations.[44] The Court ordered the legislature to amend the law with more specific targets.

2. Statutory and Administrative Claims

Climate claims are also based on statutory law, implementing regulations, and discrete agency decisions. These account for the vast majority of cases in the Sabin Database. The most common are challenges to permits, agency rulemakings, and environmental reviews.

In the United States, plaintiffs have brought actions pursuant to federal environmental laws, including NEPA, the CAA, and the ESA, non-environmental laws such as the Freedom of Information Act (FOIA) and, less commonly, securities and financial laws and regulations.[45] State environmental review laws, and state utility regulation and enforcement, have also provided grounds for climate litigation.

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[39] Held v. Montana, No. CDV-2020-307, 2023 WL 5229257 (Mont. Dist. Ct. Aug. 14, 2023).
[40] *See* Jarryd Page, *Climate Science on the Docket: How* Held v. Montana *Is Bridging Science and Law*, CLIMATE JUDICIARY PROJECT (Aug. 11, 2023), https://cjp.eli.org/news/230811-climate-science-docket-how-held-v-montana-bridging-science-and-law.
[41] *Held*, 2023 WL 5229257 (Mont. Dist. Ct. Aug. 14, 2023). *See also* Jarryd Page, *Unpacking the Headline: Climate Science and* Held v. State of Montana, CLIMATE JUDICIARY PROJECT (Sept. 13, 2023), https://cjp.eli.org/news/230913-unpacking-headline-climate-science-and-held-v-state-montana; *Not All Environmental Rights Amendments Are Created Equally: The Climate Science Behind* Held v. Montana, People Places Planet Podcast (Sept. 13, 2023), https://eli-podcast.transistor.fm/episodes/not-all-environmental-rights-amendments-are-created-equally-the-climate-science-behind-held-v-montana.
[42] Held v. State of Montana, No. 23-0575, 2024 MT 312 (Mont. 2024). *See also* Held v. Montana*: A 2025 Update*, People Places Planet Podcast (Jan. 15, 2025), https://www.eli.org/podcasts/held-v-montana-2025-update.
[43] Leghari v. Federation of Pakistan, (2015) W.P. No. 25501/2015 (Pak.).
[44] BVerfG, 1 BvR 2656/18, 1 BvR 78/20, 1 BvR 96/20, 1 BvR 288/20, Mar. 24, 2021, https://www.bundesverfassungsgericht.de/SharedDocs/Downloads/EN/2021/03/rs20210324_1bvr265618en.pdf;jsessionid=42CF380D12D4BC7215997E86CFB16409.1_cid506?__blob=publicationFile&v=5.
[45] *See* MARIA L. BANDA, ENV'T L. INST., CLIMATE SCIENCE IN THE COURTS (Apr. 2020) [hereinafter BANDA, CLIMATE SCIENCE] (providing an overview of cases by claim).

The most common statutory claims are under NEPA and state-law equivalents (see Box 4). These laws have become a commonly used vehicle for plaintiffs trying to compel agencies to adequately account for and analyze climate impacts in their decisionmaking. Federal courts have made clear that agencies need to analyze and disclose the climate change impacts of a wide array of projects, often related to fossil-fuel leasing or transport.[46] However, recent statutory and regulatory changes to NEPA, along with *Seven County*, have injected substantial uncertainty in how environmental reviews are carried out and reviewed by courts.[47] Some state laws, such as California's CEQA, expressly require environmental reviews to include climate analysis.

Box 4. NEPA Climate Cases

NEPA climate cases, of which there have been hundreds, typically involve plaintiffs claiming an agency failed to consider or failed to adequately consider climate change impacts when preparing an environmental review. For example, environmental groups alleged that the U.S. Postal Service failed to initiate a NEPA review before awarding a contract for its Next Generation Delivery Vehicles plan that would replace up to 90% of its fleet with internal combustion engine vehicles and only 10% electric vehicles. The lawsuit was withdrawn after a supplemental environmental review was conducted and the percentage of procured electric vehicles was increased. *See* Nat. Res. Def. Council v. DeJoy, No. 22-03442 (S.D.N.Y. Jan. 30, 2024).

In another example, a Ninth Circuit panel in *Ctr. for Biological Diversity v. Bernhardt*, 982 F.3d 723, 740 (9th Cir. 2020) found the Bureau of Ocean Energy Management's (BOEM) approval of an offshore drilling operation in Alaska's Beaufort Sea violated NEPA by failing to consider foreign consumption of oil (and associated GHG emissions) when evaluating alternatives to the project. The Ninth Circuit panel also found BOEM's estimation of polar bear deaths and impact on the bears' critical habitat violated the ESA.

Claims asserted under the ESA and other wildlife protection laws comprise another substantial category. ESA challenges usually involve arguments that an agency failed to consider climate impacts when making decisions about whether to list a species as threatened or endangered and when making determinations about the species' critical habitat. ESA lawsuits have also alleged that climate impacts on a project (e.g., heavy rains and extreme weather events) require an agency to consult with the appropriate wildlife agency to determine whether the action might jeopardize threatened or endangered species.[48]

Another thread of cases has arisen from EPA's GHG regulations promulgated after *Massachusetts v. EPA*, the seminal Supreme Court case that underlies the Agency's authority to regulate GHG emissions under the CAA. After *Massachusetts*, EPA issued a 2009 "endangerment finding" concluding that GHGs endanger the public health and welfare. (In August 2025, EPA proposed to reconsider this endangerment finding, although the outcome of that reconsideration is not yet settled.) Since the endangerment finding, EPA has issued regulations to reduce emissions from various sources and sectors, including from new motor vehicles and power plants. EPA climate regulations for stationary sources consistently get challenged in court, although the regulations for mobile sources such as cars, trucks, and airplanes, which EPA promulgated in close consultation with vehicle manufacturers, have largely taken effect with no litigation. The one exception is the ongoing controversy over the California

[46] Sierra Club v. FERC, 867 F.3d 1357, 1374 (D.C. Cir. 2017); WildEarth Guardians v. U.S. Bureau of Land Mgmt., 870 F.3d 1222 (10th Cir. 2017); Mid States Coalition for Progress v. Surface Transportation Bd., 345 F.3d 520 (8th Cir. 2003).

[47] Jarryd Page, *NEPA Roundup: Where Do Things Stand and Where Are They Headed?*, ELI VIBRANT ENVIRONMENT (July 24, 2025), https://www.eli.org/vibrant-environment-blog/nepa-roundup-where-do-things-stand-and-where-are-they-headed.

[48] *See, e.g.*, Greater Yellowstone Coalition, Inc. v. Servheen, 665 F.3d 1015 (9th Cir. 2011).

waiver that allows California and the states who choose to adopt its rules to require all-electric vehicles by a certain date.

In one of those stationary source cases, *West Virginia v. EPA*, the Supreme Court addressed EPA's Clean Power Plan, regulations designed to reduce climate pollution from fossil fuel-fired power plants. The Court ruled that the U.S. Congress did not in CAA Section 111(d) grant EPA authority to devise emissions caps based on the "generation-shifting" approach the Agency took there (referring to transitioning from energy generated by fossil fuels to renewable sources like solar and wind). The Court found that whether EPA could rely primarily on generation-shifting to reduce GHG emissions from power plants was a "major question" that required direct action or clearer authorization from Congress.[49] The case is relevant for specific EPA regulations that cover power plants, and also more generally for all federal agencies issuing regulations that raise issues of "vast political and economic significance" and hence trigger the "major questions doctrine."

Numerous federal agencies in recent years, through regulations or guidance documents, have incorporated climate change considerations into their decisionmaking. While the continued vitality of those federal agency actions is currently in significant question, many of them resulted in litigation, including adjustments to the "social cost of carbon," revisions to NEPA regulations, fossil-fuel leasing on public lands, Office of Management and Budget (OMB) guidance, and U.S. Securities and Exchange Commission climate risk disclosure rules, among others. Although the federal regulatory climate landscape is in flux, the focus of litigation has shifted as litigants challenge recent recissions and revisions to existing climate change regulations and continue to file challenges seeking to force agencies to act.

At the state level, state environmental assessment laws and utilities regulations are among the most common categories of cases. Consumer protection laws, often paired with common-law fraud and misrepresentation theories, are at the center of many cases brought by state and local governments against fossil fuel companies.

3. Common-Law Claims

The common law has also provided a basis for climate lawsuits. Civil law jurisdictions may have analogous statutory causes of action, and some plaintiffs have had success under these laws.[50] The most frequently asserted common-law claims rely on tort theories, notably negligence and nuisance, as well as fraud and deception, along with strict liability claims of trespass, product liability, and failure to warn. Some strict liability claims may overlap with state consumer protection claims. Public trust cases outside the constitutional context make up much of the remainder of common-law climate cases.

Tort and contract cases generally raise issues of foreseeability and reasonableness, and specifically whether climate impacts in a certain location were foreseeable and when they became so. One question is whether a first-ever or record-setting impact is necessarily unforeseeable. For example, can a defendant whose facilities are impacted by an unprecedented hurricane claim that the storm's severity was unforeseeable, by virtue of its "new" nature? Or does existing climate science that

[49] West Virginia v. EPA, 597 U.S. 697 (2022).
[50] UNEP, Global Climate Litigation Report: 2020 Status Review 43 (2020) [hereinafter UNEP, 2020 Status Review].

shows hurricanes are appearing with more intensity mean the unprecedented event is more foreseeable?

Negligence cases implicate the standard of care, in terms of both climate adaptation planning and responding to climate change-induced emergencies. For example, does a failure to consider the most reliable and up-to-date science in a planning decision breach that standard of care?[51]

Nuisance cases have proceeded in two distinct phases in the United States. In the first, plaintiffs sought to impose liability on private companies under federal public interstate nuisance theories. However, since the Supreme Court's decision in *Connecticut v. AEP* eliminated federal interstate nuisance as a cause of action, the second phase has shifted to attempting to hold companies liable based on state public nuisance. Many cases also include claims that the companies engaged in a campaign of deceptive practices about the consequences of purchasing fossil fuels in violation of state consumer protection laws. Many of these cases have been brought by state and local governments, and until 2024, have focused largely on jurisdictional questions (see Part II.B on Threshold Legal Questions).

One notable case, brought by New York City and alleging claims similar to those outlined above, avoided the jurisdictional dispute because it was initially filed in federal court, not state court.[52] In that case, a U.S. Court of Appeals for the Second Circuit panel found that the plaintiff's state-law claims were not the right fit to seek climate-related damages because "[g]lobal warming presents a uniquely international problem of national concern" to be addressed only by federal, not state, common law.[53] In issuing this ruling, the court was concerned that the suit was an effort to make policy change to regulate emissions.[54] The Second Circuit also joined the Ninth Circuit in concluding that the CAA displaces federal common law in cases that seek damages, not just in cases that seek injunctive relief as in *Connecticut v. AEP*.[55]

One Hawaii state trial court reached a different result, denying Sunoco's motion to dismiss the City and County of Honolulu's claims. The Hawaii court considered the Second Circuit's *City of New York* decision and concluded it had limited application, stating that "[t]his is an unprecedented case for any court, let alone a state court trial judge. But it is still a tort case. It is based exclusively on state law causes of action."[56] The decision was upheld by the Hawaii Supreme Court,[57] and the U.S. Supreme Court declined to get involved,[58] advancing the Honolulu case toward trial in state court.

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[51] This can include decisions by, for example, planners, architects, engineers, realtors, compliance professionals, and lawyers. *See* Keith Rizzardi, *Sea Level Lies: The Duty to Confront the Deniers*, 44 STETSON L. REV. 75 (2014); Keith Rizzardi, *Rising Tides, Receding Ethics: Why the Real Estate Professions Should Take the High Road*, 6 WASH. & LEE. J.E.C. & E. 402 (2015); Keith Rizzardi, *See, Hear and Speak No Sea Level? The Elusive Ethics of the Coastal Property Professional*, 16 GEO. WASH. J. OF ENERGY & ENV'T L. 1 (2025).

[52] *City of New York v. Chevron Corp.*, 993 F.3d 81 (2d Cir. 2021).

[53] *Id.* at 85-86.

[54] *Id.* at 91.

[55] *Id.* at 96. The Ninth Circuit concluded that the CAA displaces federal common law in cases seeking damages in *Kivalina*, 663 F. Supp. 2d at 880-82, discussed further in *infra* notes 2 and 102 and accompanying text.

[56] City & Cnty. of Honolulu & Honolulu Bd. Water Supply v. Sunoco, LP, No. 1CCV-20-0000380, 2 (Haw. 1st Cir. Ct. Feb. 22, 2022).

[57] City & Cnty. of Honolulu & Honolulu Bd. Water Supply v. Sunoco, LP, No. SCAP-22-0000429 (Haw. Oct. 31, 2023).

[58] The Supreme Court denied two petitions, Sunoco, LP v. Honolulu, Hawaii (No. 23-947) and Shell PLC v. Honolulu, Hawaii (No. 23-952), 604 U.S. __ (Jan. 13, 2025). The same term, the Supreme Court denied a motion for leave to file a

Not all state courts have agreed with Hawaii's, however. For example, Maryland and South Carolina trial courts dismissed similar claims, finding the Second Circuit's approach in the New York case persuasive.[59] On the other hand, the Colorado Supreme Court was persuaded by the reasoning in Hawaii.[60] These cases present difficult and untested questions, particularly around causation, and John Dernbach and Pat Parenteau sum up the situation well:

> The takeaway from these early decisions is that climate litigation presents a host of challenging legal and factual issues that will take some time to sort out. The cases are not a monolith. They present different claims, facts, defendants, and legal precedents. They are being heard by different judges deciding novel questions that must ultimately be decided by the highest courts in each state.[61]

Some of these untested questions may be resolved in part by attribution science. That topic is discussed in greater detail in Part III.B (Climate Detection and Attribution), as well as in Detection and Attribution and Applying Attribution.

D. Remedies

Reflecting the variety in plaintiffs, defendants, and legal theories in these cases related to climate change, there is considerable variety in the remedies sought and granted. Many are conventional remedies, including: damages for climate-related harms (that vary substantially in the amount sought); various forms of injunctive relief; declaratory judgments on whether a specific action or inaction is legal; and requests for vacatur of administrative and/or regulatory action(s). These and others are covered more extensively in Remedies.

Damages cases can be retrospective, with plaintiffs for example seeking to recover costs associated with adapting to or recovering from climate impacts, like building a sea wall or an insurance payment to rebuild one's home. They can also be prospective, such as requests to establish and supply a fund that can be used for planning and constructing projects to adapt to impacts. For example, the plaintiffs in *Multnomah County v. ExxonMobil* have requested $50 million in actual damages related to a past heatwave, $1.5 billion for future damages, and $50 billion for an abatement fund. (For more on *Multnomah*, see the Detection and Attribution Supplemental Paper.) Considering the variety of impacts and the possible number of entities involved, some predict that damages calculations will become increasingly complex given the global character of climate change.[62]

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bill of complaint invoking the Court's original jurisdiction filed by a collection of 19 states, led by Alabama, against the states that initiated such actions (California, Connecticut, Minnesota, New Jersey, and Rhode Island). Alabama v. California, 604 U.S. ___, No. 158, Orig. (Mar. 10, 2025).

[59] Mayor & City Council of Baltimore v. BP P.L.C., No. 24-C-18-004219 (Md. Cir. Ct. July 10, 2024); City of Charleston v. Brabham Oil Co., Inc., No. 2020-CP-10-03975 (S.C. Ct. Com. Aug. 6, 2025).

[60] Cnty. Comm'rs of Boulder Cnty. & City of Boulder v. Suncor Energy USA, Inc., No. 24SA206 (Colo. 2025). Suncor Energy filed a petition for writ of certiorari in August 2025. Suncor Energy (U.S.A.) Inc. v. Cnty. Comm'rs of Boulder Cnty & City of Boulder, No. 25-170 (Aug. 8, 2025).

[61] Patrick A. Parenteau & John C. Dernbach, *Who Pays for Damage From Climate Change?*, 39:4 NAT. RES. & ENV'T 23, 26 (Spring 2025), https://www.americanbar.org/groups/environment_energy_resources/resources/natural-resources-environment/2025-spring/who-pays-damage-climate-change/.

[62] *See, e.g.*, Michael Byers et al., *The Internationalization of Climate Damages Litigation*, 7 WASH. J. ENV'T L. & POL'Y 264, 302, 310 (2017).

Requests for injunctive relief have also run the gamut, from broad demands to order the government to prepare a nationwide emissions reduction plan (e.g., *Juliana*), to calls to halt specific actions until environmental assessments that account for and report on climate impacts can be conducted.

In some cases, plaintiffs have requested sweeping injunctive relief directed at making foundational changes to energy and transportation policy. In the United States, those requests have mostly failed, with *Juliana* and *Held* serving as examples. In *Juliana*, a divided Ninth Circuit panel found it was beyond the court's power "to order, design, supervise, or implement the plaintiffs' requested remedial plan"[63]; a subsequent prayer for declaratory relief was also denied. A similar injunction request by plaintiffs in *Held* was dismissed by the Montana state trial court on political question grounds; however, the plaintiffs' request for declaratory relief was granted, with the court declaring unconstitutional the state law that prevented consideration of climate impacts. The Montana Supreme Court affirmed the *Held* decision in 2024 (see Part II.C.1).[64]

In contrast, courts outside the United States have granted sweeping injunctive relief in cases against governments and, in at least one instance, against a private company. For example, in *Urgenda Foundation v. State of the Netherlands*, the District Court in The Hague, Netherlands, found that the country's emissions reduction targets were insufficient given the scientific evidence, and ordered the government to reduce GHG emissions by 25% (compared to 1990 levels) by 2020.[65]

In a separate case, *Milieudefensie v. Royal Dutch Shell plc*, the same Dutch court relied on domestic tort law, as well as the science and reasoning underpinning the *Urgenda* decision, to conclude Shell had violated the standard of care provided for by Dutch law. As a remedy, the Hague District Court ordered the company to reduce emissions 45% (compared with 2019 levels) by 2030.[66] The decision was remarkable because it was the first time a court had imposed obligations on a private company to reduce emissions.

However, that decision was reversed by the Dutch Court of Appeal, which ruled that a court could not impose specific percentage reductions. Even so, the appellate court affirmed Shell's overall obligation to limit its carbon emissions. The court reasoned that because "fossil fuel consumption is largely responsible for creating the climate problem," Shell, as a "major oil company," has a "special responsibility" to contribute to global efforts to abate climate change.[67] The Overview of European Climate Litigation covers this case in greater detail.

Settlements have figured into climate cases too. In one adaptation case, ExxonMobil closed a coastal facility in Massachusetts that was vulnerable to flooding and sea-level rise, pursuant to a settlement

[63] *Juliana*, 947 F.3d at 1171.
[64] 419 Mont. 403, 2024 MT 312 (2024).
[65] Hof's-Gravenhage 09 Oktober 2018, Case No. 200.178.245/01 (Urgenda Foundation/State of the Netherlands) (Neth.). The decision was upheld by the Dutch Supreme Court. State of the Netherlands v. Urgenda Foundation, ECLI:NL:HR:2019:2007 (20 Dec. 2019).
[66] Hof's-Gravenhage 26 May 2021, Case No. C/09/571932 (Vereeniging Milieudefensie/Royal Dutch Shell PLC) (Neth.).
[67] Case 200.302.332/01, Shell plc. et al. v. Milieudefensie et al., ECLI:NL:RBDHA:2021:5339, ¶¶ 7.26, 7.79 (Nov. 12, 2024) (Neth.). The decision was appealed to the Dutch Supreme Court in February 2025.

with an environmental nonprofit.[68] And, as noted above, in a climate rights case youth plaintiffs reached an agreement with the Hawaii Department of Transportation that provided a path for reducing emissions from the transportation sector to net zero by 2045. The settlement requires setting five-year interim targets, establishing an advisory council that includes a mechanism to solicit feedback from plaintiffs, and ongoing jurisdiction through 2045 or until the targets are achieved.[69]

And in resolving thousands of insurance claims following Maui's deadly 2023 Lahaina wildfire, a Hawaii court approved a $4-billion settlement between the claimants and Hawaiian Electric, Maui County, and the State of Hawaii.[70]

III. The Role of Climate Science in Climate Litigation

Judges in climate cases regularly assess climate science resources, including consensus reports of the IPCC and USGCRP (see Box 5), state-level climate assessments, and studies used to establish facts related to the causes and impacts of climate change on a local level.[71] This part summarizes how science has fit into the cases, including the emerging trend of attribution science.

A. Judicial Treatment of Climate Science to Date

Climate science can play a large, small, or no role in any given climate case, but it is often relevant—

Box 5. Climate Science Sources in Climate Cases

The most authoritative and commonly cited climate science resources are the synthesis reports, known as Assessment Reports (ARs), that are published periodically by the IPCC. The IPCC is a United Nations body charged with providing timely and objective climate science to the public and policymakers. The most recent IPCC report is AR6, released in 2021 and 2022. In addition, special interim reports have appeared ever since AR5 that explore the consequences of 1.5 degrees Celsius of warming, aspects of the cryosphere and the ocean, and the interactions between climate and land. The AR6 can be accessed at https://www.ipcc.ch/assessment-report/ar6/.

While the IPCC reports are global in scope, the United States Global Change Research Program (USGCRP) produces reports focused on the U.S. context. Created by congressional act in 1990, the USGCRP is responsible for coordinating efforts of 13 agencies to produce a quadrennial National Climate Assessment (NCA), a synthesis document designed to "understand, assess, predict, and respond to human-induced and natural processes of global change." 15 U.S.C. §2931(b).

The Fifth National Climate Assessment (NCA5), the most recent, was released in November 2023. The sixth was expected in 2027, but in late April 2025, the Trump Administration dismissed approximately 400 scientists who had been engaged to work on the report and has since effectively ended the USGCRP. Moreover, the Trump Administration has indicated previous NCAs—despite being accepted by the scientific community as the definitive consensus on climate science topics—may be revised to challenge those conclusions and authoritative scientific reports.

[68] Conservation L. Found. v. ExxonMobil Corp., No. 16-11950 (D. Mass.). Case summary available at https://climatecasechart.com/case/conservation-law-foundation-v-exxonmobil-corp/.
[69] *Navahine F.*, No. 22-00631 (Haw. Cir. Ct. 1st Cir. June 20, 2024). For more on this settlement, see Dara Albrecht, *Landmark Climate Settlement Highlights Relevance of Climate Science for Judges* (Sept. 19, 2024), https://cjp.eli.org/news/240919-landmark-climate-settlement-highlights-relevance-climate-science-judges.
[70] Audrey McAvoy & Jennifer Sinco Kelleher, *Parties in Lawsuits Seeking Damages for Maui Wildfires Reach $4 Billion Global Settlement*, ASSOC. PRESS (Aug. 3, 2024), https://apnews.com/article/hawaii-maui-wildfire-settlement-b4e6206cf7d8045e8e9e0473f37423c6#:~:text=HONOLULU%20(AP)%20%E2%80%94%20The%20parties,in%20more%20than%20a%20century.
[71] *See* John M. Doherty et al., *Assessing Science-Based Decision-Making in US Climate Change Lawsuits*, 37 J. ENV'T L. 117 (2025).

one 2017 study found that two-fifths of surveyed cases implicated climate science.[72] Litigation involves science and scientific principles on a regular basis, and in many ways judges do not approach climate cases any differently than other complex environmental, medical, toxic tort, or similarly science-dependent cases.[73]

Climate science may be relevant to cases in any category. It may be used as evidence of general or specific climate impacts, such as how climate change is altering water cycles, affecting agriculture, or contributing to sea-level rise. It might also be used in conjunction with a specific climate event—such as a hurricane, extreme heat event, or drought—to show how much worse or more likely that event became as a result of human-caused climate change. Still other studies aim to quantify what portion of historical emissions have come from a specific source, such as a country, economic or industrial sector, or company.

Climate science has been relevant to standing, merits, and remedies analyses, and courts have repeatedly recognized some of climate science's foundational conclusions. Notably, these are that the climate is warming and changing, and those changes are the result of increases in GHGs in the atmosphere from the extraction and combustion of fossil fuels.[74] Courts have likewise acknowledged the harms caused by climate change on local, national, and global scales.[75]

In one instance from 2018, a federal district court judge arranged for experts to provide a first-of-its-kind climate science tutorial so that he might be able to better address the issues presented in a case at bar.[76] The case was a challenge brought by the cities of Oakland and San Francisco against several fossil fuel corporations, alleging that the defendants created a public nuisance by continuing to extract fossil fuels while engaging in false and misleading advertising about the risks of fossil fuels.

In that tutorial, Judge William Alsup heard from experts about the historical development of climate science and the connections between CO_2 in the atmosphere and global temperature. Notably, the validity of climate science was not contested. Although the tutorial was not part of the trial record, Chevron's counsel stated that they accepted the scientific consensus on climate change,[77] and all five defendant fossil fuel companies went on to acknowledge the link between fossil fuels and climate change in their written Response.[78] However, Judge Alsup ultimately granted defendants' motion to dismiss on legal grounds, finding that the CAA preempted plaintiffs' federal nuisance claims.[79] More information about court-appointed experts and other judicial tools can be found in Procedural Techniques.

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[72] McCormick et al., *Science in Litigation*, *supra* note 21, at 980.
[73] *But see* Joana Setzer & Lisa C. Vanhala, *Climate Change Litigation: A Review of Research on Courts and Litigants in Climate Governance*, 10 WIRES CLIMATE CHANGE 9-10 (Mar 2019) (identifying lack of attention in literature to the challenges of engaging judges with science in climate litigation).
[74] *See, e.g.*, *Mass. v. EPA*, 549 U.S. at 508, 523, 525; *Urgenda Found.*, ECLI:NL:HR:2019:2007, at 9 (finding "[t]here is a direct, linear connection between the greenhouse gas emissions caused by humans, which are partly caused by the burning of fossil fuels, and the warming of the planet.").
[75] *Mass. v. EPA*, 549 U.S. at 521 ([t]he harms associated with climate change are serious and well recognized.").
[76] City of Oakland v. BP P.L.C., No. 17-06011 (N.D. Cal. Mar. 21, 2018).
[77] City of Oakland v. BP P.L.C., No. 17-06011, at 80-83 (N.D. Cal. Mar. 26, 2018) (Dkt. 189).
[78] *See, e.g.,* ExxonMobil Corp.'s Response to March 21, 2018 Notice to Defendants re Tutorial, Oakland v. BP P.L.C., No. 17-06011 (N.D. Cal. Apr. 4, 2018).
[79] Oakland v. BP P.L.C., 325 F. Supp. 3d 1017, 1022 (writing that "[t]he issue is not over science. All parties agree that fossil fuels have led to global warming and ocean rise and will continue to do so, and that eventually the navigable waters of the United States will intrude upon Oakland and San Francisco.").

Governmental defendants have likewise chosen to not challenge the basic conclusions of climate science. EPA, for example, did not challenge the climate facts in the administrative record when a group of NGOs, states, and industry groups challenged its reconsideration of GHG emissions standards for motor vehicles.[80] The body of litigation to date had suggested that the primary focus in future litigation will likely not be on denial of climate change, but rather on legal arguments as well as attempts to emphasize the uncertainty of scientific methods or specific conclusions. EPA's 2025 reconsideration of its landmark 2009 endangerment finding, in part on the basis of contesting the scientific foundations, however, could represent a shift. Undoing the finding on scientific grounds would require courts to reject the consensus conclusions of the scientific community, including the IPCC, which courts have to date concluded constitute the best available science regarding climate change.[81]

In certain contexts, the use of and reliance on climate science may be a legally mandated standard. For instance, the ESA requires that the agencies responsible for administering the law—the U.S. Fish and Wildlife Service (FWS) for terrestrial and freshwater species, and the National Marine Fisheries Service (NMFS, also known as NOAA Fisheries) for marine and anadromous fish—make determinations about whether to designate a species as threatened or endangered "solely on the basis of the best scientific and commercial data available."[82] The agencies must also base their designations of critical habitat for those species on the "best scientific data available."[83]

In a wildlife case, climate science can be used to show how climate change impacts the environment, habitat, and ecology of a given species. For example, a federal district court vacated a decision by the FWS to delist the polar bear, relying in part on evidence documenting the impacts of climate change on the bears' food sources, specifically the whitebark pine.[84] Many agency decisions have incorporated and extensively discussed climate science,[85] and courts have repeatedly found that the FWS and NOAA Fisheries must consider climate change when making listing decisions and critical habitat designations.[86]

How does climate science get into the record? Typically, through an agency record of decision, as in the polar bear example, or through expert testimony, as in the *Held* case. Because untangling specific aspects of climate science evidence can be highly complex, there is often a role for expert testimony in non-record review cases. This testimony on climate science will be scrutinized under one of two standards, already familiar to both federal and state court judges.

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[80] *See* California v. U.S. Env't Prot. Agency, 940 F.3d 1342 (D.C. Cir. 2019). The D.C. Circuit dismissed the case for lack of jurisdiction on the grounds EPA had not engaged in a "final action" under the CAA. *Id.* at 1345. *See also* BANDA, CLIMATE SCIENCE, *supra* note 46, at 44, discussing the case.

[81] *E.g.*, Alaska Oil & Gas Ass'n v. Pritzer, 840 F.3d 671, 679 (9th Cir. 2016).

[82] 16 U.S.C. §1533(b)(1)(A). The Secretary makes this determination after reviewing the status of the species and current protection efforts. *Id.*

[83] *Id.* §1533(b)(2) (requiring a consideration of best scientific data, along with information about the economic and national security implications, and any other relevant impact).

[84] Greater Yellowstone Coalition, Inc. v. Servheen, 665 F.3d 1015, 1020 (9th Cir. 2011) (affirming district court with respect to the food source issue).

[85] BANDA, CLIMATE SCIENCE, *supra* note 46, at 45.

[86] *See, e.g.*, Alaska Oil & Gas Ass'n v. Jewell, 815 F.3d 544, 551 (9th Cir. 2016) (recognizing as relevant the consideration of climate impacts in discussion of polar bear listing and critical habitat designation); *see also* BANDA, CLIMATE SCIENCE, *supra* note 46, at 45-49.

Most states follow the standard articulated in the *Daubert* trilogy of Supreme Court cases[87]—which is based on "scientific knowledge"—but some still follow the previous *Frye*, or "general acceptance," standard.[88] In one example, the testimony of climate scientist James Hansen was admitted in federal court over *Daubert* challenges, and a federal court relied on that testimony in a case upholding Vermont's decision to follow California in setting GHG emissions standards for vehicles.[89]

A related issue is the relationship between the confidence and likelihood statements used in climate science studies and evidentiary and burden of proof standards in the courtroom. For example, following common scientific practice, the finding that a particular extreme weather event can be attributed to climate change is usually made with a degree of confidence attached (e.g., "greater than 90%" or "*very likely*"). As a legal matter, there is no specific quantitative threshold that a scientific study must meet in order to be admitted as evidence. Rather, factors such as persuasiveness, thoroughness, believability, degree of uncertainty, and whether evidence has been refuted are typically considered.[90]

Once admitted, how does a scientific conclusion such as *very likely* (>90%) translate to courtroom burdens of proof, such as the preponderance of evidence or beyond a reasonable doubt? The scientific and legal scales do not exactly align, but there are substantial similarities that may help judges seeking to determine whether a particular study provides the necessary degree of certainty to meet a given civil or criminal standard for the burden of proof.[91]

B. Climate Detection and Attribution

One established and growing area of climate science is detection and attribution research. Detection and attribution seeks to identify the causal links between human activities and changes in the climate system, identify and quantify relevant sources of emissions, and determine the social and economic costs associated with various climate impacts. The topic is described in more detail in the Detection and Attribution module and the latest developments are explored in its supplemental paper, but there are several different strands of attribution research:

General climate change attribution seeks to determine how human activities are changing the global climate system. On this point, courts across the globe, including in the United States, agree and have consistently recognized that fossil fuel extraction, and the emissions that result from fossil fuel combustion, have a direct connection to changes in Earth's climate.[92]

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[87] Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579 (1993); Gen. Elec. Co. v. Joiner, 522 U.S. 136 (1997); Kumho Tire, Ltd. v. Carmichael, 526 U.S. 137 (1999); *see also* Margaret A. Berger, *The Admissibility of Expert Testimony*, *in* FED. JUDICIAL CTR. & NAT'L RSCH. COUNCIL, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 11 (3d ed. 2011).
[88] Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).
[89] Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295 (D. Vt. 2007).
[90] Michael Burger et al., *The Law and Science of Climate Change Attribution*, 45 COLUM. J. ENV'T L. 57, 170 (2020) (citing *Weight of the Evidence*, WEST'S ENCYCLOPEDIA OF AM. L. (2d ed. 2008), https://legal-dictionary.thefreedictionary.com/weight+of+evidence [https://perma.cc/44V B-TD4W]).
[91] *See* Charles Weiss, *Expressing Scientific Uncertainty*, 2 L., PROBABILITY & RISK 25 (2003).
[92] *See, e.g.*, Coalition for Responsible Regulation v. EPA, 684 F.3d 102 (D.C. Cir. 2012), *aff'd in part, rev'd in part*, 134 S. Ct. 468 (2013) (upholding EPA's Endangerment Finding that climate change is "very likely" caused by anthropogenic GHG emissions and threatens public health and welfare).

For example, the Supreme Court in *Massachusetts v. EPA* found that GHGs contribute to global warming—a fact not challenged by EPA defendants at the time. Beyond this, the Court found that emissions from new motor vehicles in the United States are a "meaningful contribution" to global emissions. Therefore, for purposes of determining standing, the Agency's failure to regulate GHG emissions from new motor vehicles was found to have contributed to the state's harm, namely inundated state land along the coast.[93] Questions around the significance of emissions contributions from various sources and sectors may have additional relevance in the context of EPA's attempt to revisit these questions in a reconsideration of the 2009 endangerment finding.

The *impact attribution* science explores the extent to which general temperature increases or other changes that result from an increase in GHG emissions (such as ocean acidification or sea-level rise) are impacting health, ecosystems, economies, societies, cultures, and other human and natural systems. Impact attribution studies typically focus on the relationship between climate and the impact, without looking to determine the degree to which the impact was influenced by anthropogenic activities or some other cause.

In *Massachusetts*, for example, the Court concluded that the Commonwealth's impact (inundated coastal land) could be explained by sea-level rise, a climate phenomenon that is both well-documented globally by IPCC reports and supplemented in that case by a declaration from Michael MacCracken, former Executive Director of the U.S. Global Change Research Program.[94] Moreover, courts also have consistently found that climate change is warming landscapes, reducing snowpack, altering hydrologic regimes, raising sea levels, and causing various other impacts, and that those impacts are projected to continue.[95]

Event attribution studies analyze how climate change affected the frequency, magnitude, or other aspects of a particular event, such as a hurricane, wildfire, or heat wave. One of these studies for example, concluded that the Pacific Northwest's record-shattering 2021 heat dome would have been "virtually impossible" without human-caused climate change.[96] The study was cited by government plaintiffs in *Multnomah County* and quoted in a separate wrongful death suit filed in 2025.[97] Another study calculated that the economic damages from Hurricane Sandy were $8 billion more than they would have been absent human contributions to climate change.[98] Studies like these analyze not only extreme events, but non-extreme events such as how many additional warm days per year or fewer cool days per year a region experiences as a result of climate change.[99]

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[93] 549 U.S. at 521-23.
[94] *Massachusetts*, 549 U.S. at 515.
[95] *See, e.g.*, *Massachusetts*, 549 U.S. at 521-23 (stating that "[t]he harms associated with climate change are serious and well recognized" and that, with respect to sea-level rise, "[t]he severity of that injury will only increase over the course of the next century").
[96] Sjoukje Y. Philip et al., *Rapid Attribution Analysis of the Extraordinary Heatwave on the Pacific Coast of the US and Canada June 2020*, WORLD WEATHER ATTRIBUTION (2021); *see also* Karen A. McKinnon & Isla R. Simpson, *How Unexpected Was the 2021 Pacific Northwest Heatwave?*, 49 GEOPHYSICAL RES. LETTERS (2022) (using climate models to show that the event was a one in 10,000-year occurrence).
[97] Compl., Cnty. of Multnomah v. Exxon Mobil Corp., No. 23CV25164 4, 66 (Or. Cir. Ct. June 22, 2023); Compl., Leon v. Exxon Mobil Corp., No. 25-2-15986-8 SEA 2, 20 (Wash. Sup. Ct. May 29, 2025).
[98] Benjamin H. Strauss et al., *Economic Damages From Hurricane Sandy Attributable to Sea Level Rise Caused by Anthropogenic Climate Change*, 12 NATURE COMMC'NS 2720 (2021).
[99] *See* CLIMATE CENTRAL, *Climate Shift Index (TM)*, https://www.climatecentral.org/realtime-fingerprints (last visited Sept. 22, 2025).

Finally, *source attribution* studies quantify the GHG emissions that can be attributed to a specific country, company, activity, or economic sector. Studies that quantify the historical emissions contributed by the largest oil and gas companies are emblematic.[100] Because tracing any single CO_2 molecule to any single emitter is not feasible because CO_2 is fungible in the atmosphere, plaintiffs are trying to use source attribution to help answer questions about market share of potentially responsible parties, as they were in *Lliuya* (see Part I.B.2). These studies are likely to be cited by plaintiffs in lawsuits against oil and gas corporations, and they are likely to be contested.

These strands of attribution science have arisen both directly and obliquely in climate cases. In *Native Vill. of Kivalina v. ExxonMobil Corp*, one of the earliest high-profile climate cases, the absence of attribution science was critical. In that case, plaintiffs were Native Alaskans whose village on a spit of land on the northwest Alaskan coast was threatened by rising seas, and who sued numerous fossil fuel companies seeking damages. The court dismissed the case, in part because no proffered evidence established a causal connection between a particular source of emissions and the harms suffered by their village.[101]

Since *Kivalina*, attribution science has improved and is continuing to improve. Studies claiming to establish these links are becoming more common, including studies that link all steps end-to-end in a chain of causation from emitter to quantifiable damages. For example, a 2025 study published in the journal *Nature* found that emissions from 111 top historical emitters increased the economic damages associated with one climate impact—extreme heat—by $28 trillion.[102] These sorts of studies are likely to arise in the courtroom with greater frequency as scientists continue to work in this field.

Even without formal studies, these issues are likely to continue to enter the courtroom as they did in *Held*, where the trial judge connected the dots from climate change to its impacts on the plaintiffs without the use of formal attribution science. There, the court found that climate change was resulting in lost revenues without referencing a specific study. Instead, the court drew the connections between a warmer climate, reduced snowpack, less good grazing, skinnier cows, and thus reduced profits at market based on testimony from various climate scientists about the climate impacts in Montana (reduced snowpack) and from the plaintiffs about injury (reduced profits).[103]

IV. Conclusion

In one form or another, climate lawsuits have landed in many jurisdictions and are only going to increase as climate impacts become more widespread and pervasive. Judges in state and federal courts in the United States, as well as judges around the world, can expect to see climate change issues in their cases. This module summarizes the trends, parties, claims, and climate science issues raised in the diverse array of these cases.

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[100] *Carbon Majors: Accounting for Carbon and Methane Emissions 1854-2010* (2014), https://climateaccountability.org/pdf/MRR%209.1%20Apr14R.pdf. The research was updated in 2019. Climate Accountability Institute, Carbon Majors: Update of Top Twenty Companies 1965-2017 (Oct. 9, 2019), https://climateaccountability.org/pdf/CAI%20PressRelease%20Top20%20Oct19.pdf.

[101] *Kivalina*, 663 F. Supp. 2d at 880-82.

[102] Christopher W. Callahan & Justin S. Mankin, *Carbon Majors and the Scientific Case for Climate Liability*, 640 NATURE 893 (2025).

[103] *Held*, 2023 WL 5229257, at 47-48.