Introduction

The existence, cause, and impact of global warming are the subject of extensive scientific analysis. Teams of scientists have released several reports on climate change. Two key reports are the 2007 Fourth Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) and the 2009 report on Global Climate Change Impacts in the United States released by the U.S. Global Change Research Program (USGCRP). The IPCC and USGCRP reports both conclude that warming of the climate is unequivocal, that human-induced greenhouse gas (GHG) emissions are likely causing the warming, that adverse climate-related impacts are presently occurring and that adverse climate-related impacts are expected to increase in the future, unless significant reductions of global greenhouse gases are achieved.

As the science of global warming has progressed, so have the use and acceptance of that science in the courts. The Supreme Court’s statements about climate science in Massachusetts v. EPA, while offered in the context of analyzing standing, have provided significant momentum for the judicial acceptance of climate science.

Although there are still those who want to debate the existence and/or cause of global warming, that debate is not playing out in the courts. Not surprisingly, given the scientific consensus in the IPCC and USGCRP reports, the argument has focused mostly on the impacts, not the existence, of global warming. The federal government as a litigant is constrained from challenging the existence of anthropogenic global warming by its own studies, such as the USGCRP report and its predecessors, which firmly acknowledge the phenomenon and the connection with human activities. Many industry litigants are also constrained by their publicly announced positions. The public nuisance tort claims pending in the federal courts, if they ever go to trial, may provide the greatest likelihood for adjudication of climate science, including the existence and cause of global warming.

IPCC and USGCRP Reports: Dream Evidence for a Litigator

The IPCC and USGCRP reports exude many of the indicia of reliability favored by U.S. laws of evidence. The reports contain easy-to-read summaries of peer-reviewed consensus opinions on climate science, backed by highly credentialed organizations and scientists. The scientific analysis of historical climate data and the modeled predictions of future warming and impacts have been developed outside the context of litigation, giving judicial gatekeepers and fact finders added reason to give credit to their conclusions. Both the IPCC and USGCRP reports detail the periodic review they undergo, and include sections outlining key points of ongoing climate science uncertainty.

Judicial Notice of Global Warming?

In light of the formidable scientific consensus in support of global warming, could a court take judicial notice of the fact of global warming? Although no court has formally taken notice of global warming under Rule 201 of the Federal Rules of Evidence, some courts have accepted the general fact of global warming in contexts where no record evidence has been admitted on this point. Consider the Second Circuit Court of Appeals’ recent statement in Connecticut v. American Electric Power: “It cannot be gainsaid [denied] that global warming poses serious economic and ecological problems that have an impact on both domestic politics and international relations.” This statement, which acknowledges the existence and serious consequences of global warming, comes in an appeal of a motion to dismiss, at a stage where no evidence had been admitted. In Border Power Plant Working Group v. Dept. of Energy, a federal district court relied upon the Merriam-Webster Dictionary for the definition of “greenhouse” gas and the description of the scientific principles causing the “greenhouse effect.”

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In reaching its landmark holding in *Massachusetts v. EPA* that greenhouse gases constitute “air pollutants” under the Clean Air Act (CAA) and rejecting EPA’s reasons for refusing to make an endangerment finding under Section 202(a)(1) of the CAA, the Supreme Court offered several statements regarding the existence, cause, and impact of global warming. “A well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related.” “The harms associated with climate change are serious and well recognized.” “EPA does not dispute the existence of a causal connection between man-made greenhouse gas emissions and global warming.”

These statements, from the majority opinion authored by Justice Stevens and joined by Justices Kennedy, Souter, Ginsberg, and Breyer, were offered in the context of the Court finding that the petitioners, specifically Massachusetts, had Article III standing. The evidence before the Court consisted of the record EPA had developed on the rulemaking petition and the uncontested affidavits supplied by petitioners in support of standing. One of the affidavits supplied by petitioners came from Michael MacCracken, the former executive director of the USGCRP. The uncontested affidavits had a strong influence on the Court: “In sum—at least according to petitioners’ uncontested affidavits—the rise in sea levels associated with global warming has already harmed and will continue to harm Massachusetts. The risk of catastrophic harm, though remote, is nevertheless real. That risk would be reduced to some extent if petitioners received the relief they seek.”

Justice Roberts, writing a dissent joined by Justices Thomas and Alito, would have affirmed EPA’s position that climate science remained too uncertain to make an endangerment finding. In doing so, Justice Scalia cited at length from EPA’s recitation of a 2001 National Research Council analysis on climate change science. Although the majority’s statements on climate science in *Massachusetts* are not formally binding in subsequent cases, they nonetheless have proven to have significant persuasive value and have given lower courts comfort in decisions involving climate science.

**Green Mountain**

The impact of the *Massachusetts* decision is clearly reflected in *Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie*, which devoted significant text to the Supreme Court’s analysis, particularly on the impacts of global warming. *Green Mountain* remains the only reported decision where climate science has been subject to a *Daubert* challenge. *Green Mountain* involved a challenge by the auto industry to Vermont’s adoption of California’s GHG emissions standards for new automobiles. The case went to trial on the issue of the interplay between the Environmental Policy and Conservation Act (EPCA) and the CAA and whether Vermont’s regulations were preempted by the former.

Vermont and the intervernor-defendants offered climate science testimony from two experts. Dr. James Hansen provided a big picture view of global warming,
establishing the existence of warming, the link to anthropogenic GHG emissions, the current and likely future adverse consequences, and the importance of mitigating GHG emissions from automobiles and other sources to avert a “tipping point” scenario (the idea that catastrophic climate changes may be set in motion once atmospheric GHG emissions exceed some level now being approached or perhaps already exceeded). Dr. Barrett Rock provided testimony regarding regional warming and its likely impact on Vermont, including adverse impacts to fall foliage, maple syrup production, and the ski industry.

The auto industry’s expert, Dr. John Christy, agreed that observed warming in the last 50 years was likely due to increases in GHG concentrations resulting from fossil fuel combustion. However, Dr. Christy challenged Dr. Hansen’s tipping point theory and his predictions on sea level rise. Dr. Christy also offered various critiques of the reliability of Dr. Rock’s testimony.

The Green Mountain court carefully addressed and rejected all of the challenges to Dr. Hansen’s and Dr. Rock’s testimony. The court admitted their testimony under Rule 702 of the Federal Rules of Evidence, not to determine any specific facts in issue, but rather to assist the court in understanding the background in support of Vermont’s regulations. In its findings and conclusions, the district court summarized the opinions of Dr. Hansen and Dr. Rock without qualification and without recounting any of Dr. Christy’s testimony or critiques. The district court was clearly persuaded by the weight of the scientific evidence behind Dr. Hansen’s and Dr. Rock’s testimony: “That global warming is taking place as a result of human emissions of carbon dioxide and other greenhouse gases, and that its consequences are likely to be harmful, is widely accepted in the scientific community.”

To borrow from the Second Circuit’s lexicon, it cannot be “gainsaid” that Green Mountain represents a significant victory in the courts for the consensus scientific position on global warming.

**NEPA and ESA Cases**

Most of the administrative record review cases under the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA) do not involve the admissibility of climate science and do not contain detailed analysis of competing views of climate science. There are a few cases, however, worth noting for their treatment of climate science.

The standard applied in ESA consultation cases—whether the agency relied upon the “best available science”—makes ESA cases of particular interest in a discussion of climate science in the courts. In *NRDC v. Kempthorne* and *Pacific Coast Federation of Fishermen’s Associations v. Gutierrez*, the same district court found that the Fish and Wildlife Service (*NRDC* case) and the National Marine Fisheries Service (*Pacific Coast* case) violated the ESA by relying upon historical stream flow data to predict the impact of water withdrawals on endangered fish species. In both cases, the district court criticized the agencies for failing to address available climate science modeling data indicating there would be reductions in historical flow levels, both in the Western United States and in the California streams at issue.

In the recent Ninth Circuit ESA opinion, *Greater Yellowstone Coalition v. Servheen*, climate science played an important part in the court’s decision to reverse the decision of the Fish and Wildlife Service (FWS) to “delist” Yellowstone area grizzly bears (the regulatory action to remove a species from the endangered list). The case focused in part on the role of whitebark pine nuts in the grizzly bears’ diet. In what appears to have been an uncontested finding, the court noted the link between climate change and the decline in whitebark pine trees: “The best available science indicates that whitebark pines are expected to decline due to a variety of causes, including climate change, increased forest fires, the mountain pine beetle epidemic, and the infection by white pine blister rust.” The FWS argued, nonetheless, that the grizzly bears would adapt and shift to other food sources without impacting their survival rate. The Ninth Circuit found the record evidence on this point to support the opposite position, concluding that the record showed
that the grizzly bears would not adapt to the loss of an important part of their diet.

Climate science and economics received significant attention in the Ninth Circuit’s NEPA opinion, *Center for Biological Diversity v. National Highway Traffic Safety Administration*. Several states and public interest groups challenged the National Highway Traffic Safety Administration (NHTSA) on its corporate average fuel economy (CAFE) standards enacted under EPCA. The petitioners raised two climate science arguments under NEPA: (1) that NHTSA arbitrarily assigned zero value to the benefit of carbon dioxide emissions reductions, and (2) that NHTSA failed to take a “hard look” at the greenhouse gas implications of its rule. Petitioners had submitted extensive climate science evidence in the administrative record, including the IPCC’s Third Assessment Report from 2001, key findings of which the court recited in detail. In formulating its holding against NHTSA, the Ninth Circuit found the analysis of two EPCA cases relied upon by NHTSA to be diminished because they “were decided two decades ago, when scientific knowledge of climate change and its causes were not as advanced as they are today.” In making this statement, the Ninth Circuit relied upon the *Massachusetts* statement that the “harms associated with climate change are serious and well recognized.”

On the merits, the Ninth Circuit held that there was ample record evidence to place a value on carbon dioxide emissions reductions; that the record supported a reasonable range of values starting at $3 per ton, rising to $50 per ton; and that the comments of the Union of Concerned Scientists and Environmental Defense were sufficiently reliable in showing reductions in the CAFE standards that could have been achieved had NHTSA placed a value on CO₂ emissions savings. The court remanded for NHTSA to “include a monetized value for this benefit in its analysis of proper CAFE standards.” The Ninth Circuit also rejected NHTSA’s assertion that prior EPCA case law precluded it from considering the effect of its rule on climate change under NEPA. The Ninth Circuit once again found support in *Massachusetts*, relying in this instance on the Supreme Court’s statement that EPA did not dispute the connection between global warming and man-made greenhouse gas emissions and the Court’s statement that “U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, . . . to global warming.” The Ninth Circuit also found that NHTSA had failed to adequately address cumulative impacts of the CAFE rule on climate change.

**State Court Record Review Cases**

Two state court administrative record review cases contain interesting discussions of climate science. A 1998 case from the Minnesota Court of Appeals, *In the Matter of Quantification of Environmental Costs*, shows the influence of the IPCC in U.S. courts is not just a recent phenomenon. The appeal focused on whether substantial evidence supported the decision of the state Public Utilities Commission (PUC) to set a price of $.30 to $3.10 per ton of CO₂. The PUC adopted the recommendations of an administrative law judge (ALJ), who received expert testimony from a scientist and relied heavily on an earlier version of the IPCC report (presumably the 1995 Assessment Report). The court noted that the ALJ had conducted a careful review of the evidence, including IPCC “research and the peer review process” and “research on CO₂ values by other scientific review panels.” The court affirmed the PUC’s decision.

The Supreme Court of North Dakota also faced an appeal of a PUC decision in the case *In the Matter of Otter Tail Power Company*. The PUC had approved a coal-fired power plant over the objections of environmental organizations. The relevant state statute set a high bar, requiring a showing that the power plant’s emissions would pose a threat of serious injury to the environment in the area of the plant. The PUC admitted extensive evidence from the intervenors’ expert on the contribution of coal-fired power plants to global warming and the resulting harms to the environment. However, the PUC found the emissions from the plant at issue would only increase U.S. emissions of carbon dioxide by .0007 percent and that this level of emissions would not pose a threat of serious harm to the environment or inhabitants in the local area. According traditional deference to the
PUC’s administrative decision, the North Dakota Supreme Court affirmed.

**The Tort Cases: The Best Chance for a Trial of Climate Science?**

The three primary tort cases pending in the federal courts are *Connecticut v. American Electric Power*, *Comer v. Murphy Oil, USA*, and *Kivalina v. ExxonMobil Corp*. The plaintiffs in these cases seek damages (*Comer* and *Kivalina*) and injunctive relief (*American Electric Power*) based upon allegations of injury due to the impacts of global warming. The district courts in all three cases granted defendants’ motions to dismiss, finding plaintiffs’ tort claims presented nonjusticiable political questions, and in the *Comer* and *Kivalina* cases also finding that plaintiffs lacked standing.

The trend of judicial dismissal of climate change tort claims on procedural grounds changed on September 21, 2009, when the Second Circuit Court of Appeals issued its decision in the *American Electric Power* case. The court reversed the district court’s dismissal of the case on political question grounds and found that the plaintiffs, a collection of eight states, New York City and three land trusts, had standing and that they had alleged viable federal common law public nuisance claims for injunctive relief (the imposition of emission limits) against six electric power companies that own and operate fossil fuel-fired power plants in 26 states. In reaching its holding, the Second Circuit rejected the assertion that the courts are not up to the task of assessing complex climate science, noting historical examples of courts taking on complex, cross-boundary science issues in tort cases.

The Supreme Court’s *Massachusetts* opinion played a prominent role in the opinion. The Second Circuit relied upon *Massachusetts* to reject defendants’ argument (against plaintiffs’ ability to prove the causation element of standing) that their emissions were too small relative to global emissions to be significant: “Tellingly, in *Massachusetts*’ discussion of causation, the Court rejected EPA’s argument that ‘its decision not to regulate greenhouse gas emissions from new motor vehicles contributes so insignificantly to petitioners’ injuries that the agency cannot be hauled into federal court to answer for them.’”

The Fifth Circuit Court of Appeals followed suit in the *Comer* case on October 16, 2009, when it reversed the district court’s dismissal of plaintiffs’ nuisance, trespass, and negligence claims on standing and political question grounds. The plaintiffs in *Comer* assert that sea level rise caused by global warming added to the strength of Hurricane Katrina, causing their properties to be damaged. Plaintiffs seek to hold a collection of energy, fossil fuel, and chemical industries liable for their contribution to global warming. The *Massachusetts* opinion played a significant role in the Fifth Circuit’s opinion, particularly on the standing issue. The Fifth Circuit stated the Supreme Court “accepted as plausible the link between man-made greenhouse gas emissions and global warming” and “the nexus of warmer climate and rising ocean temperatures with the strength of hurricanes.” The Fifth Circuit viewed the *Massachusetts* opinion to answer the causation element of standing: “Thus, the Court accepted a causal chain virtually identical in part to that alleged by plaintiffs, viz., that defendants’ greenhouse gas emissions contribute to warming of the environment, including the ocean’s temperature, which damaged plaintiffs’ coastal Mississippi property via sea level rise and the increased intensity of Hurricane Katrina.”

The reversals and remands in *American Electric Power* and *Comer* could result in the first U.S. jury trials where climate science is disputed. Given the stakes involved, defendants are likely to raise all colorable *Daubert* challenges to plaintiffs’ climate science experts. Nothing would prevent any of the defendants from challenging all aspects of climate science, ranging from fundamental attacks upon the existence of global warming to attacks upon plaintiffs’ ability to prove defendants’ emissions have caused or will cause plaintiffs’ alleged injuries. Plaintiffs, on the other hand, can be expected to carefully review defendants’ public positions on climate change and
climate science, to take advantage of any inconsistent positions advanced by defendants’ experts in the litigation.

Although the American Electric Power and Comer decisions have opened the door, the plaintiffs are still a long way from trial in those cases. The Kivalina plaintiffs must first convince the Ninth Circuit to follow the lead of the Second and Fifth Circuits in rejecting the political question and standing challenges to their claims. Moreover, all of the cases could run into preemption issues, given the expectation that EPA will issue final regulations limiting stationary source emissions.

Will the Chamber Get a Climate Science Trial?

The Obama EPA issued its proposed endangerment finding under Section 202(a)(1) of the Clean Air Act earlier this year, finding that greenhouse gases are pollutants in the atmosphere that endanger human health and welfare and that automobile emissions contribute to this pollution. In making its proposed endangerment finding, EPA chose to rely on existing scientific studies by the IPCC and the USGCRP, rather than generate new assessments of the scientific literature.

The U.S. Chamber of Commerce generated controversy recently by responding to the proposed endangerment finding with a request for a so-called Scopes trial on climate science. The Chamber’s request was actually more modest than has been portrayed in the press. The Chamber filed a petition asking EPA to conduct its endangerment finding “on the record” and to take evidence on certain aspects of climate science. The Chamber’s petition does not attack the existence of global warming or its connection to anthropogenic emissions, but instead points out evidence that the Chamber claims refutes many of the asserted adverse impacts of global warming relied upon by EPA. In particular, the Chamber calls into question the science in support of EPA’s conclusions regarding increased mortality rates, net impacts on particulate matter pollution, net impacts on agricultural production, forests and oceans, and impacts on extreme weather events. Although it seems highly unlikely that EPA will convene a science trial, the Chamber’s petition provides a preview of some of the science-based lines of attack that will likely be made in legal challenges to a final endangerment finding. Given the substantial deference given to EPA on matters of science, and the trend in the courts to accept the views of scientific experts and specifically the IPCC and USGCRP reports, the likelihood of a successful attack on the science underlying the endangerment finding seems remote.

Conclusion

So far, the consensus scientific position that global warming is real, that it is human-induced, and that it is causing significant harm is carrying the day in the courts. The peer reviewed, consensus-based scientific studies present a formidable challenge to litigants attempting to resist climate science. The Supreme Court’s opinion in Massachusetts v. EPA has given significant momentum to the acceptance of global warming in the courts.

Despite these developments that favor judicial acceptance of a consensus position on global warming, the debate is not over in the courts. Most of the cases to date have not lent themselves to a full battle of the experts on climate science, having been record review cases or cases decided at the motion-to-dismiss stage. The tort claims pending in the federal courts may provide the first opportunity for all aspects of climate science, including the fact of global warming and whether humans are causing it, to be put on trial in a U.S. court. If the current trend is any indication, however, the coming battles over climate science in the courts will focus mostly on the nature and extent of the injuries caused by global warming, not whether human activity is causing it.

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