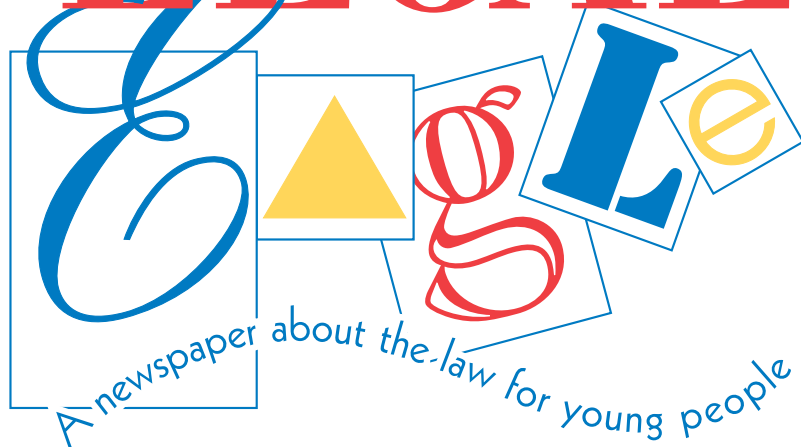


# LEGAL



VOLUME EIGHTEEN

NUMBER 3

## Experts Weigh In on Climate Change

by Jodi L. Miller

Climate change is one of the most important and challenging problems that citizens worldwide face. It knows no economic, ethnic or political boundaries—it will affect everyone eventually.

One thing scientists agree on is that greenhouse gas emissions are warming the planet and contributing to climate change. The number one source of greenhouse gas emissions in the United States, according to the

**CONTINUED ON PAGE 6**



## Fracking—Pathway to New Energy Source or Dangerous to the Environment?

by Phyllis Raybin Emert



Hydraulic fracturing, commonly referred to as fracking, is one of the most controversial environmental issues of the 21st century. Those in support of fracking, including President Obama and the oil and gas industry, view it as a means to increased natural gas production and an alternative source of energy. Natural gas is considered the cleanest of the fossil fuels and could allow America to make use of its own gas deposits. Natural gas would replace coal and decrease the amount of imported foreign oil, leading to an increase in jobs, a boost to the economy

and allow the United States to become energy independent.

Environmentalists, however, believe that fracking and the increased production of natural gas come at too high a price

**CONTINUED ON PAGE 4**

## It's in the Bag—Is Banning Plastic Bags Good for the Environment?

by Cheryl Baisden

In a number of communities across the country, local governments have imposed a requirement designed to encourage shoppers to BYOB—bring your own bag, that is. The regulations are designed to help reduce the environmental impact of plastic bags on the nation's landfills, roadsides and waterways, and to help protect wildlife from the dangers of improperly disposed of bags.

Annually, according to Jeff Tittel, director of the New Jersey Sierra Club, an environmental protection organization, over 2.5 million tons of plastic and paper bags find their way into the nation's oceans and landfills. Estimates are that less than three percent of plastic bags and 20 percent of paper bags are recycled. As a result of plastic bag pollution, birds and marine animals that swallow or get caught in the litter can be injured or die.

Additionally, when “marine animals ingest the plastics, they can enter the food chain, putting human health at risk because of the toxins in the plastic,” Tittel wrote in a *Times of Trenton* opinion column. “Plastic bags also affect water quality by clogging storm drains and filling up detention basins....The bags also pollute our beaches, parks and roadways or sit in our landfills, where they take up to 1,000 years to break down.”



**CONTINUED ON PAGE 2**



This publication was made possible through funding from the IOLTA Fund of the Bar of New Jersey.

Angela C. Scheck  
EXECUTIVE EDITOR

Jodi L. Miller  
EDITOR

**EDITORIAL ADVISORY BOARD**  
Robert J. Stickles, Esq.  
CHAIR

Kimberly Yonta Aronow, Esq.  
William Ferreira, Esq.  
John J. Henschel, Esq.  
Stuart M. Lederman, Esq.  
Louis H. Miron, Esq.  
Thomas A. Zeringo

**NEW JERSEY STATE BAR FOUNDATION  
BOARD OF TRUSTEES**  
Louis H. Miron, Esq.  
PRESIDENT

Steven M. Richman, Esq.  
FIRST VICE PRESIDENT

Patrick C. Dunican Jr., Esq.  
SECOND VICE PRESIDENT

Lynn Fontaine Newsome, Esq.  
TREASURER

Susan A. Feeney, Esq.  
SECRETARY

**TRUSTEES**  
Gwendolyn Yvonne Alexis, Esq.  
Paulette Brown, Esq.  
Paris P. Eliades, Esq.  
Eli L. Eytan, Esq.  
Kathleen N. Fennelly, Esq.  
Norberto A. Garcia, Esq.  
Hon. C. Judson Hamlin  
Robert B. Hille, Esq.  
John E. Keefe Jr., Esq.  
William A. Kraiss, Esq.  
Ralph J. Lamparello, Esq.  
Stuart M. Lederman, Esq.  
Jeffrey J. McWeeney, Esq.  
Anna P. Pereira, Esq.  
Thomas H. Prol, Esq.  
Robert J. Stickles, Esq.  
Miles S. Winder III, Esq.

## Banning Plastic Bags CONTINUED FROM PAGE 1

### San Francisco is first

Concern over the environmental issues surrounding plastic bags drove San Francisco to pass the nation's first local ordinance related to reducing their usage. In 2007, the city banned the use of plastic bags in larger supermarkets and pharmacies, requiring stores use paper bags, or that shoppers bring their own reusable bags.

Despite initial complaints from business owners and the public, the limited ban became "part of the culture," as David Assmann, a manager in San Francisco's Department of Environment told *The Los Angeles Times*. As a result of the partial ban's success, and the movement of other cities across the country to impose similar or stricter ordinances, San Francisco expanded its law in 2012. The city now bans plastic bags in all retail stores and requires store owners charge patrons 10-cents for each paper bag they give out, in an effort to encourage shoppers to bring their own reusable bags.

This time around, however, the city's environmental efforts did not go undisputed. The Save the Plastic Bag Coalition, a national organization of plastic bag manufacturers and distributors, challenged the new proposal in court, contending the city needed to conduct an environmental impact study, as required under the California Environmental Quality Act, before imposing the out-and-out ban.

The study, the coalition's lawsuit said, would reveal that "paper and compostable bags are significantly worse for the environment than plastic bags," because plastic bags use less energy, fossil fuels and water to manufacture than paper or reusable bags. In September 2012, a San Francisco Superior Court judge ruled against the coalition, and the new law went into effect.

The coalition **appealed** the decision and in December 2013 the First District Court of Appeals unanimously **upheld** the lower court's ruling.

### So, what are the options?

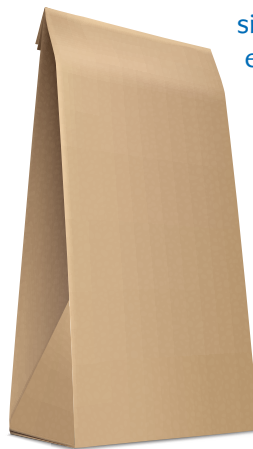
As it turns out, according to a study conducted by a consulting firm called Ecobilan, and paid for by a French supermarket chain, both types of bags have their environmental downside: Paper bags use more energy and resources to produce and emit more greenhouse gases. Plastic bags are more dangerous to wildlife and are not biodegradable.

In addition, reusable bags have had their share of bad press with claims that the bags spread food-borne bacteria. The theory is that since the bags are reused every time you go to the grocery store, a bag that may have contained meat, poultry or fish (potentially leaking juices from those items), could be used on a subsequent trip and hold fresh produce, creating cross-contamination. Critics also note keeping the bags in a car (as most people do) ready for the next

visit to the store doesn't help since any bacteria collected on a bag has a chance to grow in that type of enclosed, hot environment.

A study from the University of Arizona and Loma Linda University stated, "reusable grocery bags can be a breeding ground for dangerous food-borne bacteria and pose a serious risk to public health."

In response to these findings, *Consumer Reports* pointed out that the American Chemistry Council, the trade group that advocates on behalf of the plastic bag industry, funded the study. In addition, the study only analyzed 84 reusable bags, which they claim is not an adequate sample to draw any definite conclusions.



“A person eating an average bag of salad greens gets more exposure to these bacteria than if they had licked the insides of the dirtiest bag from this study,” Michael Hansen, a senior staff scientist for *Consumer Reports* said. “These bacteria can be found lots of places, so no need to go overboard.”

Proponents of reusable bags say that these problems can easily be remedied by washing your reusable bags between grocery trips.

### Jumping on the bandwagon

Since San Francisco first introduced its limited ban on plastic bags, 61 communities across the country have banned or instituted a fee for non-reusable bags. The largest city in the nation to approve a ban so far is Los Angeles. Under that city’s new law, plastic bags are banned from retail store use and a 10-cent fee is charged for each paper bag used.

The American Progressive Bag Alliance, a nonprofit plastic bag industry organization, complained the Los Angeles ban could eliminate 2,000 jobs in the state, and threatened to take legal action to prevent the bill from taking effect.

Officials conducted a study before passing the measure to avoid complaints that they had violated the state’s Environmental Quality Act. Ultimately, no legal action was taken against the ban.

While a statewide ban has, so far, failed to pass in California, nearly 90 municipalities across the state have instituted bans on single-use plastic bags.

### Closer to home

The assault on plastic bags has not been restricted to the West Coast. In fact, New Jersey communities, and even the state, have been exploring restrictions on their usage, noted Marty Judge, a Cherry Hill attorney with a background in environmental issues.

On a local level, the community of Red Bank chose not to impose an outright ban on plastic bags because some officials thought it might hurt business in town. Instead, in 2008 the community passed legislation requiring that all businesses have a bin for plastic bag recycling on the premises.

Red Bank also focused on education, adding a section on environmental issues to the school curriculum that includes information on plastic bags.

“Bags don’t litter,” Councilman Arthur Murphy III explained in *The New York Times*. “People litter. People can be educated. Working with the kids in schools is a great place to do this. In today’s world, a lot of people want to go green and are paying attention to the issues. We could do the same with the bags that they did with seat belts. The kids were taught in school the importance of wearing seat belts and now they all do it.”

### New Jersey statewide ban

On a state level, several bills have been drafted for consideration by the Legislature, and one, according to Judge, has a chance of passing.

As it is now written, the Carryout Bag Reduction and Recycling Act would impose a five-cent fee for every paper or plastic bag used and would require businesses offer a five-cent rebate to customers who bring their own reusable bags with them when shopping. A portion of the fee would be earmarked for the Barnegat Bay Restoration Fund. In December 2012, the Senate Environment Committee passed the Carryout Bag Reduction and Recycling Act; however, at press time, the bill still awaited a vote from the full Senate.

“I can see it passing into law, although there is one area of contention that could be a problem,” said Judge. “The problem is when it comes to the part about having to pay five cents for every plastic or paper bag you use. Some lawmakers

would label that a tax, and may argue against it. Also, businesses might argue that forcing them to create a system to keep track of all those nickels they have to collect would be a burden on them. Still, with or without that portion of the law, it may ultimately pass.”

Passage of the bill may take time, but changes in environmental thinking generally do, noted Judge, who helped draft the original recycling regulations for the

state Department of Environmental Protection (DEP) in the early 1980s while working for the state Attorney General’s Office.

“It was a process, and there was opposition and misunderstanding about what recycling was and why it was important,” recalled Judge. “But look at where we are now. It required a change in the way society views things, and that never comes quickly. But I believe state action is the answer when it comes to plastic bag legislation. Under New Jersey’s Solid Waste Management Act, which was passed in the 1970s, jurisdiction over trash rests with the state, through the DEP, not with local towns or counties.”

So far, no state has enacted a statewide law related to plastic bags—addressing either banning, taxing or recycling, although many think California is close. At least 14 states are considering some type of plastic bag ban, according to the National Conference of State Legislatures.



## Fracking CONTINUED FROM PAGE 1

for the environment and could potentially contaminate groundwater and **aquifers**, pollute rivers and streams, and lead to a general decline in health for Americans living near fracking sites. In addition, with this process large amounts of fracking wastewater need to be treated and disposed of safely, creating more potential environmental problems.

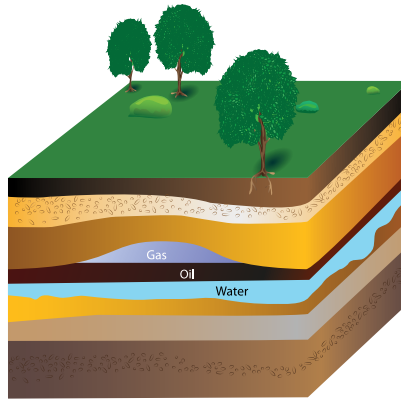
### Economics of fracking

Public opinion about fracking is divided. A 2013 Pew Research survey found that public opinion against fracking had risen to 49 percent, with 44 percent still in favor of it. One thing is certain, there is money to be made for those whose land sits on shale deposits and can sell their drilling rights. According to a *Bloomberg Businessweek* article, drilling rights in Wayne County, Pennsylvania near the Marcellus Shale were selling for more than \$3,000 per acre before the Delaware River Basin Commission put the brakes on fracking, placing a moratorium on the practice until the environmental implications could be studied.

Shale deposits tend to be located in parts of the country where farming is the main source of the regional economy. At a time when farmers are struggling, money from fracking can be seen as a blessing. The potential for job growth in this industry also makes the prospect of fracking attractive to some economically depressed areas as well.

In a 2011 *U.S. News and World Report* op-ed piece, Daniel Simmons, director of state affairs with the Institute

for Energy Research, wrote about the economic benefits of fracking for consumers as well, "In 2008, after the innovation gave way to a surge in resources," Simmons wrote, "the wellhead price of natural gas plummeted from nearly \$8 per thousand cubic feet to \$3.67 per thousand cubic feet. This increase in domestic production has kept prices low for consumers"



### The process

Fracking is not a new concept. It was first tried in the late 1940s in Kansas and Oklahoma to promote oil and gas production. It wasn't until 1981, however, that drilling into the shale rock itself was attempted. As of 2012, according to the U.S. Energy Information Administration, 30 percent of the electricity generated by Americans comes from natural gas.

In the fracking process, holes are drilled vertically, more than a mile below the surface of the earth into shale rock, then turned horizontally (90 degrees) directly into the rock formation. Hollow steel pipes called casings are used to line the inside of the well and protect groundwater and aquifers. Perforating guns are used deep in the well to create punctures and holes in the rock. Then millions of gallons of fracking fluid, which is comprised of 99 percent water and sand and one percent chemical additives, is pumped underground at high pressure to open the fractures. The open fractures allow the natural gas within the shale rock to flow back up through the pipe where it is contained on

## New Jersey—To Frack or Not to Frack

In 2011, Governor Chris Christie vetoed a bill that would have permanently banned fracking in the Garden State. Instead, he agreed to a one-year moratorium from January 2012 to January 2013 pending more research and the release of the federal EPA report on fracking, which is expected in late 2014.

While there is currently no drilling taking place in New Jersey, the issue of the overabundance of fracking wastewater, how to transport and treat it, and where to dispose of it is a prominent one in the state. Several treatment facilities have already accepted flowback from Pennsylvania. According to testimony from Tracy Carluccio, deputy director of the Delaware Riverkeeper Network, given before the New Jersey Assembly Environment and Solid Waste Committee, the state of Pennsylvania has cut back on its in-state processing of fracking wastewater and began sending it to treatment facilities in Ohio. Ohio then became overloaded with gas injection wells that resulted

in earthquakes, so Pennsylvania looked to New Jersey's treatment facilities.

In June of 2012, the New Jersey State Legislature passed the Frack Waste Bill (A575) to "prohibit the treatment, discharge, disposal and storage of wastewater...or other byproducts from natural gas exploration or production using hydraulic fracturing." Carluccio testified, "Three facilities in New Jersey have or are still accepting waste directly from hydraulic fracturing operations in Pennsylvania's Marcellus Shale according to Pennsylvania Department of Environmental Protection reports."

According to Carluccio, this wastewater is "highly toxic...[and] difficult and expensive to treat." She testified, "There are no treatment plants in New Jersey that are designed to treat wastewater from hydraulic fracturing," noting that large amounts of drilling waste, mud, and cuttings were delivered to New Jersey facilities in 2011. "Frack waste...must be banned from

the surface. Most of the fracking fluid also comes up to the surface and then needs to be disposed of safely.

### Disposing of fracking wastewater

The water that comes back up to the well surface after fracking is called flowback and its disposal is important in protecting water supplies. This flowback may carry salts, metals, oil, and production chemicals as well as naturally occurring radioactive material, arsenic and mercury that, in high levels, could pose a danger.

According to FracFocus.org, the representative website of the oil and gas industry, most of the wastewater is “disposed of in underground injection wells,” which are regulated by various state laws and guidelines, but are exempt from federal regulations. Other methods to handle the wastewater include specialized centers that treat, dispose and store the waste.

These underground injection wells have created their own environmental problem according to a July 2013 study published in the journal *Science*—earthquake swarms. While fracking itself has not been shown to cause earthquakes, disposal of fracking wastewater underground has been linked to earthquakes in Ohio, Oklahoma, Arkansas, Colorado and Texas.

The study’s lead author Nicholas van der Elst of the Lamont-Doherty Earth Observatory at Columbia University told *Mother Jones* magazine, “[The fluids] kind of act as a pressurized cushion. They make it easier for the fault to slide.”

An earthquake that struck on New Year’s Eve of 2012 in Youngstown, Ohio registered a 4.0 magnitude. Nine days after the quake, D&L Energy Group issued a statement claiming, “There has been no conclusive link established between our well and the earthquakes. Proximity alone

does not prove **causation**.” Nonetheless, the state of Ohio shut down that well and suspended all other drilling.

John Armbruster, one of the seismologists summoned to Youngstown after the quake, told *Mother Jones*, “This well caused these earthquakes. There were no felt earthquakes in Youngstown in 100 years. Within a year of the well opening, there were 12 felt earthquakes. After the well was shut down, the number decreased dramatically. You’d need Powerball odds for that to be a coincidence.”

### Investigating drinking water

The biggest concern of residents who live near fracking sites is the potential harm to their drinking water. Several studies on drinking water related to fracking have been conducted so far and many more are in progress. A 2013 study conducted by the National Energy Technology Laboratory in Pittsburgh found no evidence of fracking chemicals contaminating drinking water from the western Pennsylvania drilling site they studied for more than a year. Another study on Pennsylvania’s drinking water, conducted by researchers at the Nicholas School of the Environment at Duke University and published in the *Proceedings of the National Academy of Sciences* in 2013, also detected no chemicals in drinking water; however, the study did reveal elevated levels of gas in the water tested.

“We found much higher concentrations of methane, ethane and propane in people’s drinking water within one kilometer of the shale gas wells,” Robert Jackson, a chemical engineer and lead author of the Duke study, told Reuters. “What that means to me is that those gases are leaking out of the wells and into shallow aquifers.”

The Safe Drinking Water Act (SDWA) is the main federal law that deals with the quality of drinking water in America. According to a

**CONTINUED ON PAGE 8**

New Jersey. We don’t have the facilities to safely treat it now and we won’t know how to design those plants until the federal government finishes studying how to treat the waste safely...,” Carluccio testified.

Gov. Christie vetoed the Frack Waste Bill in September 2012, calling it “unconstitutional.” Gov. Christie stated that since there is no fracking in New Jersey and no wastewater is being treated in the state, there is no need to ban the treatment of fracking wastewater. This is contrary to Carluccio’s testimony where she identified treatment plants in Kearny, Carteret and Elizabeth that were accepting waste. The Legislature was unable to override the governor’s veto.

“New Jersey is being used as a dumping ground for frack waste,” Carluccio told *NJSpotlight*. “We know from recently obtained records that radioactivity levels in some waste received was found by the New Jersey Department of Environmental Protection to be so high it violated the company’s permit.”

### Banning fracking in New Jersey

So, could hydraulic fracturing be a viable option in New Jersey? One underground natural gas reserve in New Jersey is the Newark Basin that stretches through the central to southern portion of the state. A 2012 U.S. Geological Survey report indicated that the Newark Basin has the potential of containing a relatively small amount of gas compared to Pennsylvania’s Marcellus Shale.

Jim Benton, executive director of the New Jersey Petroleum Council, told *The Record*, “New Jersey is currently not in the top tier of areas on the radar for exploration for natural gas. Exploring the Newark Basin is still considered something that would be down the road.”

Despite this uncertainty, in September 2013, Highland Park became the first New Jersey town to lawfully ban fracking. New Brunswick soon followed suit and in December 2013 Middlesex County prohibited fracking countywide, making it the first county in New Jersey to do so.

—Phyllis Raybin Emert

U.S. Environmental Protection Agency (EPA), is electricity production, with 70 percent of our electricity coming from fossil fuels, mainly coal and natural gas. Coming in second is transportation, with 90 percent of the fuel used to power our cars being petroleum-based.

In 2009, the Obama Administration announced plans to reduce greenhouse gas emissions by 17 percent below 2005 levels by 2020. In February 2014, the U.S. Supreme Court heard oral arguments in *Utility Air Regulatory Group v. EPA*. The **plaintiffs** in the case argue that the EPA overstepped its authority in trying to regulate greenhouse gas emissions from stationary sources, such as power plants. A decision in the case could come later this year.

Recently, the American Association for the Advancement of Science, an international non-profit organization whose membership includes more than 120,000 scientists, released an 18-page report titled, "What We Know: The Reality, Risks and Response to Climate Change." According to the report, "Based on well-established evidence, about 97 percent of climate scientists have concluded that human-caused climate change is happening.... Average global temperature has increased by about 1.4 degrees Fahrenheit over the last 100 years. Sea level is rising, and some types of extreme events—such as heat waves and heavy precipitation events—are happening more frequently. Recent scientific findings indicate that climate change is likely responsible for the increase in the intensity of many of these events in recent years."

The report, released in March 2014, also stated, "Earth's climate is on a path to warm beyond the range of what has been experienced over the past millions of years. The range of uncertainty for the warming along the current emissions path is wide enough to encompass massively disruptive consequences to societies and ecosystems: as global temperatures rise, there is a real risk, however small, that one or more critical parts of the Earth's climate system will experience abrupt, unpredictable and potentially irreversible changes."

### **Asking the experts**

To answer questions about climate change and what it means for New Jersey, as well as the nation, *The Legal Eagle* went to the experts—Jennifer Francis, Ph.D., a research professor with the Institute of Marine and Coastal Sciences at Rutgers University and Dr. David A. Robinson, a New Jersey state climatologist and professor of Geography at Rutgers University. Below are their answers to our questions.

#### **The Legal Eagle: Would the Earth have warmed eventually without man's help?**

**Jennifer Francis, Ph.D.:** Actually, the Earth would be in a gradual cooling phase now if it weren't for increasing greenhouse gases and their heat-trapping properties.

**Dr. David A. Robinson:** It is highly unlikely that the Earth would have warmed any time in the years and decades ahead without man interfering with our atmosphere and lands. Such activities have resulted in rising temperatures, particularly in the past 40 to 50 years.

#### **LE: What do you say to critics who believe climate change is a hoax and point to bitter cold snaps and severe snowstorms this past winter as proof of this?**

**Dr. Francis:** I tell them to step back and look outside of their own back yards. For example, this winter around the northern hemisphere, unusual warmth has been much more prevalent than cold.

**Dr. Robinson:** Those who suggest that climate change is not occurring are simply not looking at all the evidence, which points to major changes occurring within the climate system. For instance, the atmosphere is warming, arctic sea ice coverage is shrinking in summer, snow cover is melting earlier in the spring, precipitation is falling more often in larger events, and far more warm temperature extremes are occurring than in the past while cold extremes are becoming less common. The critics are also confusing weather with climate when exhibiting a snowstorm or cold day as evidence against change. Weather events are single happenings over a day or two. Climate change occurs over years and decades, with patience required in order to identify and evaluate change.

#### **LE: Will the U.S.'s emissions policies make a significant difference to climate change?**

**Dr. Francis:** It will help, but we must do much more to slow greenhouse gas emissions. The carbon dioxide already in the atmosphere (now the highest it's been in at least 800,000 years) ensures that a lot more climate change is already "baked in" to the system, as the gas takes a long time to leave the atmosphere.

**Dr. Robinson:** While it is too late to stop climate change in its tracks, this does not mean that efforts cannot be made that would reduce any ongoing or future changes. Emission reductions in the U.S. alone will not be enough. However, such reductions cannot hurt, both the direct impact on the environment and also by setting an example for the rest of the world.

#### **LE: What do extreme weather events (droughts, forest fires, hurricanes, tornados, etc.) tell us about climate change?**

**Dr. Francis:** More and more research is finding links between climate change and observed increases in extreme events, particularly heat waves, drought, fires, and heavy downpours. More research is needed to understand links to other types of extreme weather, but those links will become clearer in the near future.

**Dr. Robinson:** With more heat in the atmosphere and oceans and more moisture in the atmosphere, one should expect that extreme weather (such as storms) and climate (such as droughts) events and impacts associated with them (such as fires) will be more frequent. However, since by definition extremes do not happen too often, it takes time to determine whether a large number of recent extremes is an example of random natural variability in the climate system or a result of the underlying increased heat and moisture that may be making common events more extreme.

**LE: New Jersey has had a number of tornados in the past few years (unheard of at one time) and our hurricanes seem to be more intense. Is this type of weather our “new normal” and will snowstorms and hurricanes continue to get worse? Do weather patterns change naturally or is this a result of climate change?**

**Dr. Francis:** Actually tornadoes are not unheard of in New Jersey, but they aren't common. Some research suggests that strong hurricanes will become more frequent, and that storms in general will become stronger because they have more heat energy and water vapor to work with now. New work also shows that the hurricane season has been lengthening, particularly late-season storms (remember Sandy came in late October). But weather patterns do change naturally in response to things like El Nino and other natural fluctuations in the ocean and atmosphere. However, we are warming the oceans and atmosphere, which is causing the amount of moisture in the atmosphere to increase, and all these effects will change weather patterns owing to climate change. Exactly how is an active area of research.

**Dr. Robinson:** There is no evidence of an increase in the number or intensity of New Jersey tornadoes or hurricanes in recent years. The state has seen a large number of major rain events in the past decade or so, some associated with tropical systems, others not. Whether this is a sign of climate change cannot yet be determined. This goes back to my explanation of extremes in the previous answer. To this we must also add that New Jersey only covers a very small portion of the globe, thus making it even more difficult to determine if and why change might be occurring here.

**LE: Sea-level rise is expected to reach 1.5 feet at the Jersey Shore by 2050 and 3.5 feet by 2100. Can sea-level rise be curbed or stopped?**

**Dr. Francis:** I would say these are conservative estimates of sea-level rise along the Jersey Shore. Most scientists now expect levels to rise more than this, but there is still a lot of uncertainty related to how Greenland and Antarctic ice sheets will melt. Sea-level rise cannot be stopped. It may be slowed somewhat if we can drastically reduce greenhouse gas emissions, but much more rise is coming.

**Dr. Robinson:** The best estimates of sea level rise above recent levels are one foot by 2050 and three feet by 2100 (estimates generated by experts at Rutgers University). There is little that can be done to avoid the next foot of rise; however further rises might be reduced or at least delayed through efforts to reduce greenhouse gases.

**LE: Environmentalists say it is not practical for the Jersey Shore to rebuild because of the sea-level rise and the increase in stronger storms for the region. What is the best way to protect the state's shoreline from severe weather?**

**Dr. Francis:** Building natural barriers, like sand dunes, seems to be the most effective method, but getting people out of harm's way is ultimately what will save lives. Some areas should not be rebuilt, at least not with tax dollars—if people want to take on the risk themselves and pay high insurance rates (if they can even get insurance), that's their choice, but it doesn't seem fair to expect the rest of us to pay taxes toward rebuilding homes in locations that we know are susceptible to flooding caused by rising sea levels and heavier rainfall. Businesses should probably be rebuilt more readily, as they add to the economy of the area, but there should be some plan to create a “storm fund” from their profits.

**Dr. Robinson:** This is clearly a difficult, emotional issue that will have to be addressed not only today but also by our young citizens, as they become adults. There truly is no best way to protect the shoreline. Such decisions will have to be based on changing local conditions along ocean and bay shorelines and will also involve evaluating the impact of changes on what people have built in threatened areas.

**LE: Some estimates have the Earth warming as much as nine degrees by the end of the century. What are some real-life examples of what weather would be like if this happens?**

**Dr. Francis:** Nine degrees of warming will be catastrophic. We can't imagine the storms and damage that will result, difficulties in growing food, displacement of cities...We must do whatever we can to prevent this from happening.

**Dr. Robinson:** A change of nine degrees is a really big deal when you are talking about average temperatures over a year. A nine-degree difference over even a day can also be major, especially if you are talking about hot summer temperatures or the difference between temperatures below freezing in a snowstorm versus being warm enough for that storm to only deliver rain. Overall, a nine-degree rise in temperature would make New Jersey's climate more like that of South Carolina. 🌧️



Congressional Research Service report titled “Hydraulic Fracturing: Selected Legal Issues,” the U.S. Environmental Protection Agency (EPA) regulates the underground injection of solids, liquids, gases and other fluids to protect groundwater and aquifers. It was debated for 15 years, according to the report, whether hydraulic fracturing should be considered an “underground injection” and therefore able to be regulated by the EPA under the SDWA.

In 2005, the Bush Administration inserted an amendment to the SDWA, stating that the Underground Injection Control (UIC) requirements “do not apply to hydraulic fracturing, although the exclusion does not extend to the use of diesel fuel in hydraulic fracturing operations... Provisions of the Resource Conservation and Recovery Act (RCRA) exempt drilling fluids, produced waters, and other wastes [associated with fracking]....”

The EPA has been conducting an extensive multi-year study on the potential impact of all phases of hydraulic fracturing on America’s water supply focusing on five cases in Pennsylvania, Texas, North Dakota and Colorado. A draft of the EPA’s report is scheduled to be released in late 2014; however, the agency advised that a final version would not be available until sometime in 2016.

### Hard to prove in court

According to Professor Steve C. Gold of Rutgers School of Law—Newark, people (or environmental groups) in court not only have to prove that there is water contamination or air pollution from fracking wells, but that it is causing damage or illness. In the case of air pollution, it “may constitute [what is called] a trespass. But,” stated Professor Gold, “to win a trespass claim for pollution emissions, plaintiffs usually have to show that the pollution on their land has caused some harm to

them. For example, plaintiffs have succeeded with trespass claims when drifting pesticides from neighboring fields contaminated their homes, or when toxic chemical particles from nearby factories landed on their farms or sickened their cattle.”

Regarding water contamination, Professor Gold, who was formerly with the Environment & Natural Resources Division of the U.S. Department of Justice, explained that you would have to prove that the water was contaminated “by taking samples...and analyzing them chemically. Then you’d have to know that the contaminants were the same as...the chemicals used in the fracking process. That requires knowing what chemicals were used in the fracking. Finally, you’d have to trace the contaminants from the water supply back to the fracking operation.”

Proving illness or injury is the most difficult. Professor Gold noted that chemicals in the water supply may not cause sickness, or that an illness may not appear until years after the water contamination. There must be “some kind of laboratory testing” that links the illness to chemicals specifically found in the fracking process. He gives an example that “exposure to benzene [a chemical often found in hydraulic fracturing] can cause chromosome damage that can lead to leukemia. If the chemical *can* cause the disease, it can still be hard to prove that the chemical *did* cause the disease.”

### States vary

The response to fracking varies by state (see sidebar for more on the fracking issue in New Jersey). Pennsylvania has been very open to drilling, whereas Vermont has banned fracking statewide. New York is in its sixth year of a moratorium on fracking pending further investigation, and Massachusetts is considering a ban. In November 2013, three Colorado towns (Boulder, Lafayette and Fort Collins) instituted fracking bans,



### CLEAN DRINKING WATER

while a fourth ban in Broomfield was narrowly defeated by 13 votes. Meanwhile, California is currently debating whether to go ahead with hydraulic fracturing since massive rock formations exist in the Monterey Shale from the central area of the state into the ocean.

On a federal level, the Fracturing Responsibility and Awareness of Chemicals Act, also known as the FRAC Act, was first introduced in 2009. The FRAC Act would regulate hydraulic fracturing federally under the Safe Drinking Water Act and require the energy industry to disclose the chemical additives used in hydraulic fracturing fluid. The legislation was last reintroduced on June 11, 2013; however, GovTrack, a government transparency website, gives it a nine percent chance of getting past the committee stage and a one percent chance of being enacted. 🗳️



**appeal** — a complaint to a higher court regarding the decision of a lower court.

**aquifer** — a body of permeable rock that can contain or transmit groundwater.

**causation** — in negligence cases, being the cause of something.

**plaintiff** — person or persons bringing a civil lawsuit against another person or entity.

**upheld** — supported; kept the same.