The report oil companies are worried about: Climate attribution science

These approaches are still the subject of ongoing development, so the report has two recommendations: researchers should be very transparent about the uncertainties in what they're doing, and they should develop tools to make these analyses useful for disaster preparedness. Knowing that a new weather extreme is possible is far less useful than knowing what aspects of the extreme pose the highest risks.

Normal science

Beyond the specifics of the report, the biggest takeaway is that this is normal science. Researchers have done a lot of work to explore one scientific question, and other researchers are taking the resulting knowledge and tools and applying them to new questions. There are some cases where that has been immediately effective, but there are plenty of others where there's still considerable work to do.

At that level, it's difficult to see why anybody would even find this report notable beyond its top-line conclusions about where we're most confident. It's even more difficult to see why preparing the report would cause political operatives to launch a FOIA campaign against those authors who happen to work at public universities, as described in the Politico report mentioned above.

The reason the report has stirred up controversy ahead of its release is that the fossil fuel industry views it as a threat.

The industry has faced a large number of lawsuits accusing it of everything from fraudulently misleading the public to being responsible for financial damages from weather events. It’s those latter suits that make this report a threat. By presenting attribution as normal science that we’re increasingly confident in, it raises the prospect that courts will allow the scientific evidence developed by the field to be used as evidence in the courtroom.

The situation has been made worse by the fact that the National Academies were already involved in a political fight over the use of climate science in the courtroom. State officials had demanded that the report it prepared on the use of science by judges have a chapter on climate change deleted. The academies have refused, leading to the threats against their funding mentioned above.

Regardless of those threats, the report has now been released. It may take a few years to see whether the fossil fuel industry’s fears are realized in courtrooms, but it’s safe to expect that we’ll see attacks on the science detailed here in the meantime.

https://arstechnica.com/science/2026/07/national-academies-climate-attribution-is-maturing-but-still-has-limits/

Sotheby’s big T. rex auction raises concerns hype and wealth are upending science

When asked by WIRED about the origin of the bite-mark claim, Hatton replied, “The bite marks are very clear, and are not all straight punctures but lateral bites where you can clearly see the shape of the tooth. You can also tell from the edges of the hole whether the break is clean, or if the hole is gradual (which would be more likely the result of a parasitic or other infection that gradually and evenly eats the bone).” She did not indicate where this analysis came from.

But the central issue with auctioning fossils, researchers contend, is that when specimens end up in private hands, they become unavailable for scientific study. Even if a private collector loans a fossil out for display or study at a museum, as happened last year when the American Museum of Natural History in New York City secured a four-year loan of Griffin’s *Stegosaurus*, such an arrangement violates a central tenet of paleontology: Scientific reproducibility requires that researchers other than those conducting the original examination have access to those same fossils in perpetuity.

That approach allows paleontologists to validate findings, test new hypotheses, and build knowledge of the past. To ensure access, fossils must be held in public repositories on a permanent basis. So vital is this covenant that established scientific journals won’t publish a study on a specimen that isn’t in the custody of a publicly accessible museum, Sumida explains.

Everything scientists have been able to piece together from fossils about prehistory—from the origin of multicellular life to the dawn of humankind—rests on this system.

“A scientifically important fossil isn’t just a static object; it’s a permanent source of data that future generations of scientists will study with tools that haven’t even been

invented yet—but only if the fossil remains in the public trust," says Kristi Curry Rogers, a paleontologist at Macalester College. "Think about all the cool discoveries that have been made in the last 50 years about dinosaur diets, body temperatures, coloration, reproduction, vocalization, neurobiology—none of these discoveries would have been possible if the fossils had disappeared into private collections."

https://arstechnica.com/science/2026/07/sothebys-big-t-rex-auction-raises-concerns-hype-and-wealth-are-upending-science/

These painted e-tattoos could be the future of wearable biosensors

Credit: Wanqing Zhang

Credit: Wanqing Zhang

Scientists at Pennsylvania State University have developed a novel conductive ink that can be painted directly onto the skin in colorful custom designs, turning into a functional electrode for biomonitoring after drying. They described their work in a new paper published in the Proceedings of the National Academy of Sciences (PNAS).

As previously reported, epidermal electronics attached to the skin via temporary tattoos (e-tattoos) have been around for more than a decade. So-called e-tattoos connect to skin

without adhesives, are practically unnoticeable, and are typically attached via temporary tattoo, allowing electrical measurements (and other measurements, such as temperature and strain) using ultra-thin polymers with embedded circuit elements.

However, these e-tattoos have their limitations, most notably that they don't function well on curved and/or hairy surfaces, as well as requiring personalized electrode placement design to cover larger areas, since biosignals are spatially distributed. So scientists have been getting creative. For instance, in 2024, researchers developed special polymer-based conductive inks that can be printed onto a person's scalp to measure brain waves, even if they have hair. This could one day enable mobile EEG monitoring outside a clinical setting, among other potential applications.

Penn State mechanical engineer Larry Cheng, a co-author of the new PNAS paper, has been working on electrode designs for biomonitoring applications for more than 10 years, including EEGs, ECGs (for heart activity), and EMGs (for muscle contractions). Using rigid materials, like metals, makes for a stable biomonitor, but it is easily dislodged when the wearer moves too much, such as during exercise. Hydrogels have emerged in recent years as alternative materials, since they can absorb water, swell, and stretch with the body's skin during movement. But hydrogels degrade rather quickly and lose those benefits with prolonged use.

As easy as face paint

Sweat or hair can also reduce the accuracy of recording biosignals. That's because commercial electrodes are prefabricated and then applied to the skin, creating an air gap that weakens sensor readings. Cheng et al. decided to develop their conductive ink to address that issue. They mixed together several different kinds of polymers and acidic

additives in a water-based ethanol/polyvinyl alcohol solution. PEDOT:PSS—aka poly (3,4-ethylenedioxythiophene): poly (styrene sulfonate)—provided electrical conductivity, along with DBSA (4-dodecylbenzenesulfonic acid), which also served as a plasticizer to give the ink flexibility.

https://arstechnica.com/science/2026/07/these-painted-e-tattoos-could-be-the-future-of-wearable-biosensors/

Flores Hobbits' eating habits offer clues about their evolutionary past

Until about 60,000 years ago, diminutive hominin cousins, *Homo floresiensis* (affectionately nicknamed Hobbits for obvious reasons), shared the island of Flores with Komodo dragons, pygmy elephants, and giant rats.

Based on the presence of hominin and pygmy elephant bones in the same layers of cave sediment, it originally looked like the Hobbits had hunted and butchered dwarf elephants—an impressive feat for such a tiny hominin. But according to University of Tübingen anthropologist Elizabeth Veatch and her colleagues, it was the Komodo dragons that were the hunters, while the Hobbits only showed up to scavenge what was left.

If Veatch and her colleagues are right, their findings may challenge some of the assumptions we've made about *Homo floresiensis*—and about which hominin species was the first to

venture into the wider world beyond Africa.

These small hominins weren’t big-game hunters

Extinct pygmy elephant bones unearthed at Liang Bua (the cave site that also seems to have sheltered *Homo floresiensis*) are covered in marks from Komodo dragon teeth, as well as cut marks from stone tools. Based on these bones, we know that Hobbits and the ancient ancestors of today’s Komodo dragons shared a taste for the same type of meat: pygmy relatives of modern elephants, called Stegodon. At least three species of Stegodon lived on Flores, ranging from 1.25 to almost 2 meters tall and weighing anywhere from 500 kilograms to 1.5 tons.

To better understand the Stegodon bones and how they got to Liang Bua, Veatch and her colleagues started by feeding a nearly whole goat carcass to a Komodo dragon (as one does). The Komodo dragon at Zoo Atlanta had its best day ever, and the researchers compared what resulted to the Stegodon bones from Liang Bua.

The Komodo dragon has serrated teeth and a habit of gripping prey and then shaking its head side to side to rip the flesh away from the bone. This left distinctive marks on the bones, marks that were usually shallower, shorter, and wider than cut marks from stone tools. Veatch and her colleagues also noticed that the zoo’s Komodo dragon went straight for the meatiest parts of the body, which happened to be the same areas where archaeologists found tooth marks on the Stegodon bones at Liang Bua: parts like the limbs and the surprisingly fat-rich feet, as well as the ribs.

https://arstechnica.com/science/2026/07/flores-hobbits-scavenged-komodo-dragons-elephant-kills-study-suggests/

Payloads used to dictate the terms of launch. That’s finally changing.

But flat-packed, stackable satellites allow operators to deliver more capability to orbit faster. Starship will take this to the next level with its capacity to launch SpaceX’s more powerful Starlink V3s.

“On a Falcon 9, they can only launch 27 of these V2s,” Jones said. “The Starship can launch 60 of these larger V3s. What this means is bandwidth per launch amounts to 61,000 gigabits per second on Starship versus 2,600 gigabits per second for V2s on Falcon 9. In other words, almost 24 times as much bandwidth can be deployed per launch on Starship versus the Falcon 9 and the V2 satellites. That’s huge.”

Of course, costs are not the same as prices. SpaceX charges commercial customers $74 million for a dedicated Falcon 9 launch, about five times the internal launch cost. This still makes Falcon 9 the most affordable and reliable launch option in the Western world. It’s too early to know where or when SpaceX will set Starship launch prices. Part of the calculation will hinge on the progress of SpaceX’s competitors, such as Blue Origin.

“Certainly, that’s what the industry wants to see, is two equal players,” Jones said. “It absolutely contributes to the economics in terms of price per kilogram.”

“We’ve got these two rocket companies vying for positions,” Jones said in an interview. “I think it’s going to be important that we have competition here, and one company seems to be ahead right now, but whether you’re first to market or a fast follower, I think we would all benefit from seeing this competition between these two companies, Blue Origin and SpaceX. I think that’s critical.”

Some economists believe Starship is simply too big to fulfill all of SpaceX’s lofty goals, but Jones doesn’t buy it.

“Sometimes, when you increase the size of any type of transportation system, it creates something called diseconomies of scale, where the marginal costs start to increase,” Jones said. “Now, I think Starship is going to prove a new price point, but some think that when you get too big, kind of like the [Airbus] A380 airplane that tried to compete with the [Boeing] 747, it created all sorts of demands and types of maintenance.

“Could the Starship follow that path and become not relevant? I don’t really believe it,” she said. “I think that they’re going to have to prove it. They’re going to have to prove over time that they can fly the Starship and continue to see marginal costs decrease, and hopefully the space sector will discover a new sweet spot, but right now it’s the Falcon 9.”

https://arstechnica.com/space/2026/07/rocket-developers-used-to-chase-satellite-trends-is-the-inverse-now-true/

TikTok users don’t have as

much agency over their FYPs as they think

“We basically work from the assumption that if we want data, then we need to obtain it ourselves,” Sapiezynski said of their account cloning approach. “Even if we did, for example, want to use the official TikTok researcher API, none of the user agency is covered there. You can see what content is available, but you cannot see individual timelines that will tell you how the algorithm reacts to a particular user watching or not watching a particular video. Similarly, with the European Union’s researcher data access, all of this data can only be accessed aggregated and not from a perspective of a single user. So when you want to really study personalization, this research cannot be done on the aggregated data.”

Mind the gap

The team ran their experiments multiple times on the 90 cloned accounts and made side-by-side comparisons, using both implicit and explicit signals, to see how TikTok’s algorithm responded in terms of recommended content on the FYPs. They focused on three popular topics: cooking videos, fitness videos, and sports betting.

The “not interested” button proved most effective, reducing unwanted content by around 84 percent, compared to just a 48 percent reduction from merely skipping videos. “So if you don’t want to see something, you should be hitting that button,” said Kaplan. But the authors note that the “not interested” option seems to be deliberately hidden from users. And it was very easy for the algorithm to “relapse” into once

again flooding an FYP with previously unwanted content; even a brief re-engagement by a user is sufficient.

“It turns out that it works in the beginning,” said Sapiezynski. “When you start saying, ‘I don’t want to see this particular topic,’ the platform might actually show you fewer of such pieces of content. But then the platform will slowly start putting it back in your feed. And if you don’t *continue* saying, ‘I really don’t want to see it,’ this may balloon back to the place where it was in the beginning. So the platform does react to your negative feedback, but then it also very much reacts to your express behavior. So if you are presented with this content again and you start watching it, the platform will again feed it to you more and more.”

In other words, be consistently very active with your feedback—constant vigilance!—when it comes to curating TikTok’s FYP. The researchers hope to test this hypothesis on real user data in the future. That said, “We can teach users how to use the platform better, but ultimately the way that you’re interfacing with the platform is going to be dictated by the design decisions that are fundamental to the platform,” said Kaplan.

Proceedings of the Twentieth International AAAI Conference on Web and Social Media, 2026. DOI: 10.1609/icwsm.v20i1.42688 (About DOIs).

https://arstechnica.com/science/2026/07/how-much-control-do-tiktok-users-really-have-over-fyps/

Miami-based City Labs achieves a first for commercial nuclear power in space

The proliferation of nuclear power in space got a little more real Tuesday with the launch of a small satellite developed by a Florida-based company specializing in nuclear micro-power technology.

It’s a long way from launching a bona fide nuclear reactor, a breakthrough that could help power a permanent Moon base and efficiently drive rockets throughout the Solar System. But you have to start somewhere.

The satellite from Miami-based City Labs is named BOHR, short for Betavoltaic Orbital High-Reliability, and it launched on a SpaceX rideshare mission Tuesday alongside 80 other payloads. SpaceX’s Falcon 9 rocket released the BOHR satellite into an orbit between 350 and 400 miles (nearly 600 km) in altitude.

Starting small

City Labs bills the BOHR mission as “the world’s first commercial nuclear-powered satellite and first nuclear CubeSat.” CubeSats are modest in scale, and images released by City Labs suggest BOHR is built on a “1U” CubeSat platform, a cubical design measuring about the same size as a softball. BOHR’s power source is a nuclear betavoltaic battery that generates electricity from the decay of tritium, a radioactive isotope of hydrogen.

“This is a historic step for commercial nuclear power in space,” said Peter Cabauy, CEO of City Labs, in a statement. “BOHR demonstrates that safe, compact, and regulatory-approved nuclear power systems are ready for routine commercial deployment. This capability enables persistent, always-on payload operations that are not constrained by sunlight or battery life.”

City Labs will use its experimental NanoTritium power generator in demonstration mode to supply electricity to a payload onboard the BOHR CubeSat. The spacecraft itself uses conventional solar power for regular operations, the company said. Betavoltaic batteries are best suited for low-power applications that require a reliable, long-duration source of electricity. These use cases include remote terrestrial sensors—such as in undersea or polar locations—and instrumentation for secure communications. City Labs is also studying the use of its NanoTritium technology to power implantable medical devices.

https://arstechnica.com/space/2026/07/miami-based-city-labs-achieves-a-first-for-commercial-nuclear-power-in-space/

NRC is (sort of) getting rid of “as low as reasonably achievable” standard

To replace ALARA, the NRC will start with a limit at which evidence clearly indicates radiation impacts would be apparent

and set exposure thresholds below that. From lowest to highest exposure, these thresholds will require increasingly aggressive efforts to limit exposures.

The language of the details is a bit confused, however. As its name implies, the LNT model suggests there are no thresholds below which biological risks go away, and the NRC accepts that model. Yet it's regulated based on thresholds. It's also referring to those thresholds as an implementation of an "optimization" approach to safety. But it also quotes a definition of optimization that refers to it as a form of ALARA—which, again, is a term that the NRC wants to get rid of.

Beyond that action, the rule changes the NRC is proposing largely focus on updating regulations on the use of equipment to monitor exposures. Technology has advanced since the agency last modified its requirements there, and it's using this proposal to update them accordingly.

Number crunching

Regardless of the confusion, it's clear that the changes aren't going to cause the sort of boom in nuclear power that the Trump administration expected in its executive order. One of the key features of the planned rules is that any organization that's currently in compliance will remain that way without making any changes. Changes will only make sense if an organization thinks it can save money by adopting them.

And, as noted above, those savings for industry will be pretty minimal, with the total estimated at $9.5 million a year. Even if we assume that these savings go only to nuclear power and are ascribed only to dropping ALARA (as opposed to cheaper exposure monitoring, for example), spread out across the 57 nuclear plants in the US, that means just an average savings of a bit over $150,000 per plant.

So, those who viewed ALARA as the cause of all the nuclear industry’s woes will likely be excited to see the NRC eliminate it. But they’ll also be disappointed to find that its scientific foundations remain intact, and the regulatory environment will be minimally changed as a result.

https://arstechnica.com/science/2026/07/nuclear-regulatory-commission-plans-really-minor-changes-to-safety-regs/

Katalyst’s satellite rescue mission is now in pursuit of NASA’s Swift

NASA has a clear interest in saving the Swift mission. The $500 million observatory’s primary mission is detecting gamma-ray bursts, the most powerful explosions in the known Universe. Despite its age, astrophysicists still rely on Swift’s multi-wavelength instruments to identify and locate gamma-ray bursts for follow-up observations by other observatories.

But part of the reason for launching a rescue mission to Swift is simply to see if it can be done. NASA launched Space Shuttles to service and upgrade the Hubble Space Telescope, but those missions required hands-on work from spacewalking astronauts. A safer, cheaper robotic servicing platform would have a broader set of applications.

“This is a historic mission,” said Robert Lamontagne, vice

president of strategic partnerships at Katalyst. “Some would call it the first of its kind, a robotic spacecraft that can go and capture an unprepared satellite. It’s a commercial mission, first and foremost. It’s doing an operational, real-world objective. It’s not just a demonstration. We’re doing this as a service.

“At Katalyst, we are very passionate about the idea of dynamic space operations,” Lamontagne said. “What I mean by that is, for years and years, folks have thought about space as something where you build a satellite, you launch a satellite, it does its mission, and at the end of the mission, it gets disposed of, either it re-enters, or it goes to a graveyard orbit. That’s a throwaway type of model.

“We think the spacecraft operator should no longer be constrained by the silly decisions that we made before launch,” he said. “You should be able to refuel, reposition, repurpose, repair, and even upgrade satellites, even if they were never prepared for it, and that’s where Katalyst is trying to change everyone’s mindset.”

https://arstechnica.com/space/2026/07/katalysts-satellite-rescue-mission-is-now-in-pursuit-of-nasas-swift/

Chemical accidents rise as Trump administration proposes weakening safety rules

The new statistics released by PEER were made public as a result of a lawsuit PEER and other groups filed to compel the Chemical Safety Board to disclose industrial chemical releases as required by the Clean Air Act. A federal judge ruled in 2019 that communities have a right to know what hazardous chemicals are released nearby.

Yet Trump's EPA removed a public data tool designed to inform communities of nearby risks last year. President Trump has also tried to eliminate the Chemical Safety Board by withholding funding, though Congress has continued to fund the agency.

Earlier this year, the administration proposed to significantly weaken RMP rules finalized in 2024 "to reduce regulatory burden" and accepted public comment on the rules until early May.

The Biden administration's strengthened RMP rules require a number of measures to reduce the risk of catastrophic accidents, including safer-alternatives analyses, independent analyses of accidents' root causes, worker participation in accident-prevention plans and preparations to adapt to climate change.

An EPA spokesperson said the agency is reviewing public comments and continues to work toward completing the final rule in late 2026.

"EPA's proposal relies on a rigorous analysis of RMP reportable incidents between 2014 and 2023, which shows accidental releases unequivocally declined significantly over that period," the spokesperson said. "This means that RMP-regulated facilities had successful prevention programs in place before the Biden EPA finalized its nonsensical and burdensome 2024 rule."

The Biden EPA used the same data and came to the opposite conclusion, said PEER's Ruch. Plus, he added, "the conclusion

that any decline is due to industry prevention plans is a supposition which the current EPA does not have the data to support.”

Meanwhile, chemical accidents resulting in evacuations, injuries, or multiple casualties continue to happen at least once a week.

“With each passing year the risk gets greater because the infrastructure continues to age,” Ruch said. At the same time, he added, “the federal response to it is shrinking.”

This article originally appeared on Inside Climate News, a nonprofit, non-partisan news organization that covers climate, energy, and the environment. Sign up for their newsletter here.

https://arstechnica.com/science/2026/07/chemical-accidents-rise-as-trump-administration-proposes-weakening-safety-rules/