Concerned Scientists

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Catalyst Volume 17, Summer 2017

Sea Level Rise Hits Home New UCS Analysis

Avoiding Nuclear War

What Next for the US After Paris?

Concerned Scientists

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The Union of Concerned Scientists puts rigorous, independent science to work to solve our planet's most pressing problems. Joining with citizens across the country, we combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

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ABOUT THE COVER: Holland Island, in the Chesapeake Bay, is an early victim of rising seas and sinking land. Pictured here in 2009, the last remaining house on Holland Island collapsed in 2010. See p. 8 for more on impacts to neighboring Smith Island and other coastal communities.

[FIRST PRINCIPLES]

Keeping Alive the Goals and Spirit of the Paris Climate Agreement



By Ken Kimmell

President Trump's decision to withdraw the United States from the Paris climate accord marked a new low, even for this administration. The president's announcement at the White House Rose Garden, before a virtual who's who of fossil fuel-backed climate deniers, was a torrent of misinformation and outright falsehoods.

Particularly galling to me was the way President Trump misrepresented the world's response to the signing of the accord, saying, "The rest of the world applauded when we signed the Paris Agreement they went wild; they were so happy—for the simple reason that it put our country, the United States of America, which we all love, at a very,

very big economic disadvantage."

As someone who was there in Paris and joined in the cheering, I know that nothing could be further from the truth. After decades of false starts, participants in the Paris accord—and millions of people around the world—cheered the unprecedented agreement as a triumph of multilateral diplomacy. They cheered the real hope the accord offered that the nations of the world could finally come to grips with the climate change crisis and increase the chances of leaving a habitable planet to our children and grandchildren. As I wrote at the time upon my return from Paris in December 2015, if the accord made good on that promise, we could truly claim to have "changed the course of history and demonstrated, for the first time ever, the power of an entire world united in a common cause."

ROGUE NATION

Now, with President Trump's woefully misguided move, the United States joins only Nicaragua and Syria as a rogue nation not party to this agreement. The evidence is already mounting that pulling out of the Paris accord will diminish the standing of the United States in world affairs and have major repercussions on our nation's ability to collaborate with other nations on many critical issues including trade and terrorism. (*continued on p. 20*)

WHAT OUR MEMBERS ARE SAYING

Here's a sampling of recent feedback from the UCS Facebook page (www.facebook.com/ unionofconcernedscientists) and Twitter feed (www.twitter.com/ucsusa)

ON PRESIDENT TRUMP'S DECISION TO WITHDRAW FROM THE PARIS CLIMATE AGREEMENT

Norine Dobiesz: I don't get it! Trump said pulling out of the agreement will create jobs. Why wouldn't staying in create jobs-jobs created by innovation to address climate change?

Kenneth Garm:

f This is one of two end-ofcivilization-as-we-know-it hot topics for me.... How can we, a powerful, developed country, not work with the rest of the world to address an issue that could change the lives of our children and grandchildren?

@RobertGeertsen8:

It truly is about priorities. Why put the health of our planet such a distant second?

Michelle Boyer-White:

We have now joined Nicaragua and Syria-the only countries that did not sign the Paris climate accord. China has been waiting for a leadership position and Trump just gave them the opportunity.... It is like we were in the computer age and Trump has just taken the US back to paper and pencil.

WHY DID YOU PARTICIPATE IN THE MARCH FOR SCIENCE AND/OR **PEOPLE'S CLIMATE MARCH?**

Phyllis Kaufman: Because it's our only home. There is no planet B. A good parasite does NOT kill its host.

f Marisel Brown: Every journey begins with the first step.... There is much more work ahead; however, for the first time I can recall, science as a critical cornerstone of modern society was a news story. Keep on keeping on white coats!

f Christina Nichols Blanchard-Horan:

Science is founded in factssomething this administration is ignoring. The people will not stand for it. Not this scientist nor any others that I know.

Susan Clark Hughes:

The earth needs our help, so do the scientists.

CORRECTION:

self-driving vehicles (Spring 2017), we wrote that the vehicles onboard radar system sends out sound waves to detect objects. Radar systems send out electromagnetic waves, not sound waves. We regret the error.

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New UCS analysis finds many coastal communities face chronic flooding-and soon. The time to prepare is now.

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As a review of US nuclear weapons policy gets under way, UCS recommends how to make us safer.

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A Crescendo of Activism for Science, Climate, and Justice



Left: UCS staff members pushing the "big climate science blackboard" at the People's Climate March in Washington, DC; right: UCS staff and members of our Science Network meet with Maine Senator Susan Collins (second from left) during our legislative action week in April.

This spring, the Union of Concerned Scientists took to the streets, and to Congress. Staff members worked closely with coalition partners to rally attendees for the March for Science and the People's Climate March, bringing UCS members together with us in an unprecedented amount of activism and legislative action. The results were inspiring.

The March for Science on April 22 was the largest set of demonstrations for science ever held, involving 1 million people in some 600 satellite marches worldwide. UCS turned out a strong presence for the main event in Washington, DC, as well as Albuquerque, Boston, Chicago, San Francisco, Santa Fe, and many other locations, and recruited more than 800 new Science Network members that day alone.

Equally notable, in the week following the March for Science, UCS organized our largest legislative action initiative ever.

Some 35 members of the UCS National Advisory Board and 50 Science Network members participated in more than 75 meetings with members of Congress and their staffs on Capitol Hill, stressing the urgent need for climate action and the importance of basing our governmental decisions on solid science and evidence. We held an equal number of meetings with Republican and Democratic offices; two dozen of which were attended by the members of Congress themselves. As UCS National Advisory Board member Anthony Tindall put it, "UCS really walked the walk in April, showing how important it is to reach out directly to our elected officials on issues that matter. Our initiative on Capitol Hill made me proud to be part of UCS."

Following the week of legislative action, UCS worked closely with labor and faith groups and communities on the front lines of climate change to help plan the April 29 People's March for Climate, Jobs, and Justice. UCS organized phone banks to personally contact thousands of our members and supporters, and helped coordinate and underwrite buses that transported some 200 students from historically black colleges and universities to the march in Washington, DC. The event drew an estimated 200,000 marchers on a sweltering day—more than twice the number organizers had hoped for—with many tens of thousands more participating in satellite marches around the country.

UCS Climate Campaign Manager Kate Cell, who led much of the UCS legislative and organizing activity, marvels at the level of commitment and intensity of UCS staff, members, and supporters. Now, she says, "we must keep up the momentum: keep raising our voices, contacting our representatives, growing our movement, and demanding climate action and social justice."

Ensuring Science Helps Protect Endangered Species

Since 1973, the federal and state agencies responsible for enforcing the Endangered Species Act (ESA) have helped bring dozens of threatened species back from the brink of extinction, including the American bald eagle. The act stipulates that decisions to protect species must be based on the best available science. But this scientific foundation faces a mounting threat as special interests such as oil companies and large landowners push for legislation and administrative changes that would turn endangered species determinations into largely political decisions.

The good news: UCS is fighting back, helping scientists play a key role in safeguarding against abuses. A new UCS toolkit offers advice for scientists and others interested in plant and animal conservation, outlining the processes and agencies involved in listing a species under the ESA. We identify the points in the process where scientists can provide input, and explain how they can identify and speak out against attempts to undermine science. Download it and get started at *www.ucsusa.org/ESAtoolkit*.

Advancing Science in the Endangered Species Act A Technellor Scienting



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Fighting Back against Trump's Two-for-One Rule

The Union of Concerned Scientists does not go to court often but, in June, we felt compelled to file an "amicus"—or friendof-the-court—brief in a case brought by a number of nonprofit organizations challenging the Trump administration's so-called two-for-one executive order. This order requires federal agencies to repeal two regulations for every new one they issue, and requires that the cost of any new regulation be fully offset by the cost savings derived from repealing existing ones.

UCS was moved to weigh in on this legal action because the two-for-one order goes against everything we stand for. The order is profoundly irrational, substituting a slogan for the hard work of government, and willfully requires federal agencies to ignore the best available science—even if it would protect Americans from new threats to their health, safety, or environment. Just think about this: if this order had been in place since the 1970s, we probably wouldn't have been able to take lead out of gasoline, mandate seat belts, or keep toxic chemicals out of children's toys.

Already, the executive order is having a detrimental effect. Earlier this year, the Environmental Protection Agency was poised to issue a regulation preventing the discharge of mercury into public sewer systems, but backed off from the rule because it would have had to repeal two other rules.

UCS also believes this executive order is flatly illegal. The organization is fortunate that the venerable Boston law firm Foley Hoag, which has a long history of public service, has agreed to represent us pro bono. Our attorneys have written a compelling brief detailing how the order violates the law, including the argument that it compels federal agencies to take "arbitrary and capricious action."

Stay tuned. A court hearing on President Trump's two-for-one executive order will likely be held sometime this summer, with a decision possible as early as this fall.

Victory at ExxonMobil Shareholder Meeting



On May 31, in a decisive rebuke to ExxonMobil's leadership, shareholders at the company's annual meeting voted by a two-to-one margin to support a proposal calling on the company to report annually on the impact global measures designed to keep climate change below 2°C are having on its business. The vote marked the first time ExxonMobil shareholders have passed a climate-related resolution.

Over the past several years, UCS has been increasing the pressure on ExxonMobil to take climate action, with our climate accountability campaign helping generate visibility and investor support for this vote. In our inaugural *Climate Accountability Scorecard* released last October, ExxonMobil received an "egregious" score for failing to renounce disinformation about climate science and policy.

"Five years ago, climate wasn't even on the map for fossil fuel companies or their investors," Kathy Mulvey, UCS climate accountability campaign manager, explains. Now, she says, disclosure of climate-related financial risks has become a mainstream expectation, and fossil fuel companies are on the defensive. "The ExxonMobil shareholders' vote is a testament to the tireless work by advocates, scientists, and community leaders to shift the public conversation around climate change and to assert that yes, climate change is happening; yes, it's getting worse; and yes, companies will get left behind if they don't pull their heads out of the sand."

In the week leading up to both the ExxonMobil and Chevron shareholder meetings, Mulvey and the UCS climate accountability team cosponsored an expert panel discussion on climate change and fossil fuel company responsibility that drew a packed house at Rice University in Houston. The panel was moderated by Neal Lane, former science advisor to President Bill Clinton, and included Robert Bullard, often described as the "father of environmental justice," and Susan Pacheco, an associate professor of pediatrics at the University of Texas Medical School. They and other panelists made a forceful case that ExxonMobil and Chevron must act now on climate to serve the interests of their own investors, public health, and environmental justice for communities facing the greatest threat from climate change.

As Mulvey notes, "It's going to take public pressure to hold these companies accountable. ExxonMobil talks the talk about the Paris climate agreement and carbon pricing, but the company is still lobbying for policies that will lead to three to four degrees of warming, and its own reports show the company gave nearly \$2 million to think tanks, advocacy groups, and other industryaffiliated associations that dispute climate science, disparage renewable energy, and block climate policy action."



André Droxler, professor of earth science and scholar at Rice University's Baker Institute in Houston, speaks during a panel discussion on climate change and fossil fuel company responsibility.

Addressing Climate-Related Water Issues in California



After years of drought, California received more rain than its reservoirs could manage, leading to flooding at the Oroville Dam (pictured here) and elsewhere.

In California, UCS is increasingly working to address water issues related to climate change. Last fall, we played a key role in the passage of a state law creating a voluntary registry to track energy consumption and climate pollution from water use. Now, we are helping California advance sustainable water management systems and government transparency by lending our support to a "water wells" bill (SB 252) that would make basic information about new groundwater wells in critically overdrafted groundwater basins publicly available. The bill recently passed out of committee and now moves to the floor of the state legislature. UCS also joined with the California-based Community Water Center to cohost two daylong workshops that trained local water officials about climate science and groundwater management, which will help the state develop smarter water sustainability plans in the months and years ahead.

UCS Reaches a Teen Audience

UCS members are used to seeing our scientists and analysts quoted in the *New York Times, Science,* and other prestigious publications. This spring, though, Gretchen Goldman, research director for the Center for Science and Democracy at UCS, authored a piece called "Why Scientific Truth Matters" for a media outlet that has offered a surprisingly fierce voice opposing the Trump administration's harmful policies: the magazine *Teen Vogue.* Goldman's article joins a collection of recent pieces in *Teen Vogue* that are helping to educate and engage young people—especially young women—in politics, including "Donald Trump Is Gaslighting America," and "Why We ALL Need to Be Activists Right Now." In her article, Goldman clearly explains the vital role of science in a functioning democracy. "Today, science is under threat," Goldman writes. "If we can't make decisions based on science, we all lose." You can find the article at www.teenvogue.com/story/ why-scientific-truth-matters.

SCIENCE UP YOUR SUMMER!



UCS members receive **10% OFF** any purchase! Just enter the code **UCSMEMBER10** at checkout.





SOUNDING NEW UCS ANALYSIS FINDS MANY COASTAL COMMUNITIES FACE CHRONIC FLOODING-

SAN FRANCISCO, CA: BY MID-CENTURY, CHRONIC FLOODING FROM SEA LEVEL RISE IS EXPECTED TO AFFECT COMMUNITIES ON THE WEST COAST.

AND SOON. THE TIME TO PREPARE IS NOW.

SMITH ISLAND, MD: FIFTEEN PERCENT OF ITS USABLE LAND NOW FLOODS AT LEAST 26 TIMES PER YEAR; ONE-THIRD OF ITS RESIDENTS HAVE ALREADY LEFT.

MIAMI, FL:

MEASURES TAKEN TO PROTECT WEALTHY MIAMI BEACH FROM ALREADY REGULAR FLOODING DO NOT EXTEND TO THE CITY, WHICH HAS FEW PLANS IN PLACE TO COPE WITH SEA LEVEL RISE.

The map above shows the many communities along the East, West, and Gulf Coasts that could face chronic flooding by 2100 if we do not begin preparing today for sea level rise and take action to prevent it from reaching catastrophic levels.

SOUTHERN LOUISIANA: TODAY, 10 PERCENT OR MORE OF THE LAND IN 60 COASTAL COMMUNITIES FLOODS EVERY OTHER WEEK, ON AVERAGE.

ALARM ON SEA LEVEL RISE

NEW YORK, NY:

BY THE END OF THE CENTURY, FOUR OF THE FIVE BOROUGHS WILL EXPERIENCE CHRONIC FLOODING—AFFECTING HUNDREDS OF THOUSANDS OF RESIDENTS. BY PAMELA WORTH

When Americans think about rising seas caused by global warming, we tend to summon mental images of neighborhoods underwater, as in New Orleans after the levees failed during Hurricane Katrina, or in New York after Hurricane Sandy. But as the new Union of Concerned Scientists analysis *When Rising Seas Hit Home* demonstrates, the effects of sea level rise can be slower and more insidious.

Some of us living in coastal communities have already experienced how the slow creep of sea level rise increasingly intrudes on our daily lives. In the decades ahead, millions more will feel it personally, or watch it unfold. A team at UCS set out to identify the amount of time coastal Americans have left to respond to sea level rise induced–flooding before it reaches an unmanageable point. The goal: to provide easy-to-understand, location-specific data on flooding, so that coastal residents can adequately prepare—and demand federal, state, and local leadership on this issue. It can't come a moment too soon.

"From greater Boston to Key West, from the Everglades to Corpus Christi," UCS Senior Analyst and lead report author Erika Spanger-Siegfried says, "hundreds of communities will be threatened with retreat from flooded areas just in the next few decades."



Chronic flooding is already taking its toll in downtown Annapolis, Maryland. The city is facing the need for major investment to keep businesses in its vibrant waterfront district alive as flooding increases.

To analyze what's in store for many communities in the coastal United States, the team set out to quantify the threshold of sea level rise-induced chronic flooding that would disrupt people's daily lives and routines. After speaking with experts and residents of flooded communities, the team set the threshold at flooding that affects 10 percent or more of a town or city's usable land, and occurs 26 or more times each year. From there, using storm gauge data and sea level rise projections under three different scenarios, the team crunched the numbers to determine which communities would be affected, and when.

The results are dramatic and surprised even many of our scientists and analysts—starting with the fact that 90 communities have already crossed the threshold of disruptive inundation.

CANARIES IN THE COAL MINE

Many of these now-inundated communities are rural, with small populations, and are located where you might expect flooding due to the unfortunate combination of sinking land and rising seas: the Eastern Shore of Maryland and coastal Louisiana. On Maryland's Smith Island, where about 15 percent of the land is chronically inundated as of today, the population has declined by one-third over the last seven years; its primary school now has nine students total. On Isle de Jean Charles in the Louisiana bayou, the Biloxi-Chitimacha-Choctaw band has asked for and received federal assistance to relocate to

Depending on our climate policies, between 500 and 670 communities will face chronic flooding by 2100.

higher ground as a community, as their land is lost to the sea. Such retreat may be in the future for hundreds of coastal US communities; others teeter on the threshold but are already experiencing the serious consequences of encroaching flooding.

Take, for example, the case of Fouché Sheppard, a wellknown resident of Charleston, South Carolina. Sheppard is a poet and storyteller, and a longtime advocate for youth and seniors. She also worked as an administrative assistant at a medical office

[STAFF SPOTLIGHT]

By mid-century, large chronically flooded zones will emerge in places that seldom flood today, including Alameda and San Mateo, California.

until she was fired for not showing up to work. The reason she couldn't come to work: water. Sheppard says the streets that led downtown were blocked by what people in Charleston call "nuisance flooding"—a taste of the chronic inundation to come.

"I said to my supervisor, 'You're firing me because you're lucky enough to live in one part of town and I live in another?"" recounts Sheppard. "I'm worried that if this keeps up, it's going to affect a lot of people just trying to get by. How many people are going to lose their jobs when they can't get to work because their car has been destroyed by flooding?"

DISPARATE CONSEQUENCES

According to our analysis, by the year 2035—just 18 years away—the number of chronically inundated American cities and towns will jump to 170 given moderate rates of sea level rise, and 180 given a faster rate. One-third of these communities would lose the use of half or more of their land. In 20 communities, mostly in Louisiana, residents will lose more than 75 percent of their currently usable land, rendering much of today's bayou communities unrecognizable. Other regions that will become chronically inundated are the Jersey Shore, North Carolina's Pamlico Sound, and South Carolina's Lowcountry.

Using a common metric known as the Social Vulnerability Index, UCS also found that more than half of the communities facing disruptive flooding by 2035 are home to low-income neighborhoods, and neighborhoods composed predominantly of residents of color. If poorer communities are located alongside wealthier communities and both are poised for chronic inundation, the former will of course have fewer resources with which to respond. But report coauthor and Senior Climate Scientist Astrid Caldas points out that rising seas aren't the only problem facing low-income residents of coastal communities.

"If a wealthy coastal community faces inundation, and a less wealthy community is located on higher ground nearby," she says, "residents could be priced out of their homes as those with more resources seek to move out of harm's reach. It's gentrification by rising seas." (continued on p. 18)



Nicole Hernandez Hammer: Helping Neighborhoods Prepare for Sea Level Rise

In South Florida, Miami Beach garners the most headlines, and expensive solutions, related to sea level rise-induced flooding; hundreds of millions of dollars have already been invested in pumps and other mitigating measures. Over the bridge in the city of Miami, however, entire neighborhoods are at the mercy of rising seas with little planning or money invested to help them—and many residents aren't aware that the sunny-day flooding ruining their cars and closing their roads is caused by sea level rise. UCS Climate Science and Community Advocate Nicole Hernandez Hammer has worked the last several years to change this.

Hammer has spent much of her professional life studying the effects of sea level rise and climate change on her beloved city. In the last decade, she's created maps of Miami's lowest-lying neighborhoods, where high tides are likely to cause flooding, and then visited those at-risk neighborhoods to confirm the inundation.

In the predominantly Hispanic neighborhood of Shorecrest, on Miami's upper east side, Hammer brought together community leaders and nonprofit partners at events where she explained the science behind Shorecrest's flooding, and how it was likely to get worse. It took more than a year to draft, but the Shorecrest sustainability manager recently sent Hammer the neighborhood's preliminary plans to address chronic inundation. Hammer's science education and advocacy, combined with a community's initiative for preservation, may well have saved one neighborhood from being caught unaware by worsening floods.

African Americans' Enduring Opposition to Nuclear Weapons

INTERVIEW WITH VINCENT INTONDI

How did you become interested in the civil rights dimension of anti-nuclear activism, and what inspired you to write your book?

VINCENT INTONDI: For most of my life as an academic and an activist, my work revolved around civil rights and the black freedom movement. Nuclear weapons weren't on my radar; they seemed like an abstract issue. But in 2005, I made my first trip to Hiroshima and Nagasaki. I met with atomic bomb survivors. I went to museums and ceremonies. And I was filled with such anger and guilt over what my country had done that when I returned, I realized I needed to find a way to combine these two passions of mine, eliminating racism and eliminating nuclear weapons. I asked my advisor how I could do this, and he suggested trying to answer the question: How did African Americans feel about dropping the atomic bombs on Hiroshima and Nagasaki?

Many colleagues warned me that I wasn't going to find much of a response because African Americans were understandably—too busy at the time trying to gain their own freedom and equality. But they were wrong; there was a large response. That's what led to the book.

What did your research turn up?

VINCENT INTONDI: Obviously black communities are not monolithic, so not everyone was thinking the same thing. But what I found is that, in many cases, African Americans were looking at the issue of nuclear weapons differently from most white people, through a lens of race and colonialism. After the bombs were first dropped in August 1945, a majority of the American public rejoiced. A Gallup poll conducted the week after showed that 85 percent of the American public agreed with President Truman's choice. That



VINCENT INTONDI is an associate professor of history and director of the Institute for Race, Justice, and Community Engagement at Montgomery College in Takoma Park, Maryland. He is also director of research for American University's Nuclear Studies Institute in Washington, DC. Intondi's research focuses on the intersection of race and nuclear weapons. He is the author of the 2015 book African Americans Against the Bomb: Nuclear Weapons, Colonialism, and the Black Freedom Movement (Stanford University Press).



wasn't the case in the black community. Immediately after the bombing, the first to come out against Truman's decision were atomic scientists, church leadersand leaders in the black community. Langston Hughes was one of the first to question President Truman's racism, and what role it might have played. Paul Robeson was asking questions about where we got the uranium to build these weapons; the answer was Belgiancontrolled Congo. Bayard Rustin also made a link to European colonialism in Africa, pointing out that the development of these weapons led to the French wanting to conduct their first nuclear test in the Sahara. They were looking at it in a way that many whites simply weren't.

I also wanted to know what the rank and file thought, so I went through black newspapers from the era, read letters to the editor, and researched sermons given in black churches. I saw a pattern of African Americans thinking and talking "How can we talk about broken-down infrastructure in Baltimore and Anacostia, and not talk about how we're spending a trillion dollars on nuclear weapons?"

about race as it related to the bomb. The most far-reaching criticism initially came from the black popular front.

What came of that early criticism and condemnation? Did it inform a broader movement during the Cold War?

VINCENT INTONDI: Well. in later years, it wasn't easy to be critical. After the Truman Doctrine in 1947, the worst thing you could be labeled was "Black and Red." Groups like the NAACP made a calculated decision on this issue to turn right, embrace anti-Communism, and align with Truman, in hopes of gaining civil rights. However, leaders like W.E.B. Du Bois, Paul Robeson, and others didn't see peace as a bargaining chip. They saw the start of the Korean War. They saw an arms race with the Russians. They decided to fight against the potential use of nuclear weapons against another people of color in Korea. They were connecting what was happening in the civil rights movement with other liberation movements around the world.

What do you most want readers to take away from reading African Americans Against the Bomb?

VINCENT INTONDI: That racism and nuclear weapons are not separate issues. For so long, we've looked at nuclear disarmament as a white middleclass pacifist issue. And while there are many white pacifist middle-class antinuclear activists, African Americans were active in the movement, and saw the liberation of nonwhite people around the world as inextricably linked to their own struggle. We hear a lot about intersectionality today, and how movements are connected. My book demonstrates this intersectionality. How can today's young activists best connect with these issues?

VINCENT INTONDI: I think the best strategy is tying activism about nuclear weapons to other issues. One strategy is to link to the economic conversion argument. For example, how can we talk about broken-down infrastructure in Baltimore and Anacostia, and not talk about how we're spending a trillion dollars on nuclear weapons? If we can show how that money could be better spent, that can be a key to getting these movements back to where they were in the 1980s. The movement then was relatively inclusive, and one tactic that

PARTN

was effective during that decade was a focus on economics.

It also helps to have a concrete cause, and that cause today could be the United Nations treaty to ban nuclear weapons. A legal framework at the UN to ban nukes in 120 countries is something that people can get behind. Finally, nuclear activists always ask me what they can do to connect with Black Lives Matter and other civil rights activists. My response to them is, first, just show up for those movements. People will eventually see that you're there. Don't go to talk at them but to be an ally. Solidarity will be built and it will be reciprocated. **{C}**

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An unarmed Minuteman III intercontinental ballistic missile is launched from California's Vandenberg Air Force Base during an operational test in 2013. To: President Donald Trump From: Union Of Concerned Scientists Date: July 1, 2017

LET'S AVOID A NUCLEAR ARMS RACE

Comments by the Trump administration seem to be encouraging a new arms race. As a review of US nuclear weapons policy gets under way, UCS has recommendations to make us safer.

BY ELLIOTT NEGIN

For the past several decades, every new US president has initiated a "Nuclear Posture Review" (NPR), a Pentagon-led, months-long process that lays out the administration's nuclear weapons strategy. The last one, released by the Obama administration in 2010, was heralded by the Union of Concerned Scientists as "the most far-reaching since the end of the Cold War," appropriately reflecting "the reality that nuclear weapons have become a liability in today's world."

But that was then.

Now we have a president who has made some deeply disturbing comments about nuclear weapons. During last year's presidential campaign, candidate Donald Trump repeatedly said it was important to be "unpredictable" about whether the United States would use nuclear weapons. He wondered aloud why we have nuclear weapons if we wouldn't use them. He said he wasn't particularly worried about more countries getting nuclear weapons. And tellingly, he apparently had no idea what the term "nuclear triad" means. When asked which leg of the triad—bombers, submarines, or missiles—is a priority for him, Trump responded, "I think, for me, nuclear is just the power; the devastation is very important to me."

President Trump has already directed the Pentagon to undertake a new NPR, scheduled to wrap up by the end of this year. We don't know how it will deviate from President Obama's plan but we do know it will have enormous consequences: making the world safer *or* substantially more dangerous.

"The Nuclear Posture Review offers a renewed chance for the United States to reduce the threat of global annihilation from nuclear weapons," says Lisbeth Gronlund, codirector and senior scientist in the UCS Global Security Program, "and that concern should remain paramount as it is drafted." For the United States, nuclear weapons are a liability, not an asset. With this in mind, we're urging the administration to take steps forward by rejecting Cold War–era policies that make us less safe.

WHAT ARE NUCLEAR WEAPONS FOR?

The United States has long reserved the right to use nuclear weapons first, a policy UCS wants to change. The NPR offers an opportunity to establish that the only reason the United States retains nuclear weapons is to deter a nuclear attack on this country or its allies—in other words, the United States would use nuclear weapons only in response to a nuclear attack.

The Obama administration took a small step in this direction, declaring that the "fundamental"—but not the only—role of US nuclear weapons is to deter a nuclear attack. That language still allowed the first use of nuclear weapons, while declaring that a no-first-use policy was a long-term objective. However, at the end of the Obama presidency, Vice President Biden stated that he and President Obama had concluded the United States *should* take this step. UCS calls on the Trump administration to do so and declare that the only purpose of US nuclear weapons is to deter a nuclear attack.

HOW MANY NUCLEAR WEAPONS DO WE NEED?

"It would be wonderful—a dream would be that no country would have nukes," President Trump said during a February interview. "But if countries are going to have nukes, we're going to be at the top of the pack."

The United States *is* already at the top of the pack, possessing more nuclear weapons than any other nation: an estimated stockpile of 4,480 warheads, of which approximately 1,740 strategic warheads are deployed on ballistic missiles or at bomber bases as of January 2017. Russia has the secondlargest nuclear arsenal: an estimated 4,300 warheads, of which 1,950 are deployed on missiles or at bomber bases.

The other seven countries with nuclear weapons have arsenals ranging from 100 to 300 warheads. France, with the third-largest arsenal, has 300 warheads, for example, followed by China with an estimated 260, none of which are deployed.

If everything goes according to plan, US and Russian deployed weapons will be limited early next year. In 2010, the two countries signed the New Strategic Arms Reduction Treaty (New START), which limits countable deployed strategic nuclear warheads to 1,550 by February 2018. The treaty was ratified by the Senate in a bipartisan 71–26 vote and enjoys widespread support among senior military brass.

But all may not go according to plan. During his presidential campaign, Trump complained that Russia

"outsmarted" the United States when negotiating the treaty and he made wildly inaccurate claims about what the treaty allowed and prohibited. And when Russian President Vladimir Putin suggested extending the treaty during a phone conversation with President Trump in February, Trump again complained that the treaty favored Russia and was a "bad deal" for the United States.

UCS strongly recommends that the Trump administration extend the treaty for another five years before it expires in 2021. Unless both countries agree to do so or negotiate a new treaty, neither will be bound by the current treaty's limits, which could potentially touch off a significant new nuclear arms race.

NO ONE WINS A NUCLEAR ARMS RACE

Remarkably, President Trump has said he relishes the prospect of an arms race. Last December, he tweeted that the United States "must greatly strengthen and expand its nuclear capability until such time as the world comes to its senses regarding nukes." A day later, during an appearance on the MSNBC show *Morning Joe*, Trump went further, saying he welcomed an arms race if it bolstered US superiority. "Let it be an arms race," he reportedly said in an off-air remark. "We will outmatch them at every pass and outlast them all."

For all intents and purposes, the United States and Russia have already embarked on a nuclear arms race of sorts. Despite President Obama's soaring rhetoric about a world without nuclear weapons, his administration put in place a plan to spend as much as \$1 trillion over the next three decades on a new generation of nuclear warheads, bombers, submarines, and intercontinental ballistic missiles. Russia is also developing a new suite of subs, missiles, and bombers, although it has hit some major obstacles, including a number of missile test failures.

This dynamic undercuts US security and is completely unnecessary. The United States can deter a nuclear attack with far fewer nuclear weapons than are called for in the current plan, which would replace every warhead and nuclear delivery system with a new one—at an enormous cost. The Trump administration should make the smart choice of paring back and refurbishing warheads and delivery systems instead of building new ones, potentially saving taxpayers hundreds of billions of dollars while enhancing US security.



WHY NUCLEAR WEAPONS ARE A LIABILITY

Nuclear weapons are unlike any other type of weaponjust one can wreak almost unfathomable damage. A typical warhead of 300 kilotons (i.e., with a yield equivalent to 600 million pounds of dynamite) detonated above a city would incinerate or otherwise kill every person and living thing within a one-mile radius. People within three miles would not fare much better, being crushed by collapsing buildings and receiving severe burns and exposure to potentially lethal doses of radiation. For many major cities, this would amount to roughly 1 million dead and an additional 2 million seriously injured. And that from just a single warhead. Any use of nuclear weapons would almost certainly provoke retaliation, meaning far more devastation still.

That's why a growing number of US military and security experts consider the country's large arsenal of nuclear weapons to be a liability. Nuclear weapons do not address today's threats from rogue states such as North Korea or from terrorists that may seek to buy or steal a warhead. Any use of a nuclear weapon, whether deliberate or accidental, would cause unacceptable devastation. And, even if the rationale for nuclear weapons is solely to deter a nuclear attack on the United States and its allies, a *much* smaller arsenal would suffice.

WILL PRESIDENT TRUMP ABANDON THE GOAL OF NUCLEAR DISARMAMENT?

Finally, under the 1968 Nuclear Non-Proliferation Treaty (NPT), the United States—as one of the five nations actually possessing nuclear weapons among 191 signatories—is legally obligated to pursue negotiations leading to nuclear disarmament. All US administrations since the treaty was signed have at least paid lip service to that goal.

For its part, the Trump administration has not yet committed to the long-term goal of nuclear disarmament. According to Christopher Ford, the National Security Council's senior director for weapons of mass destruction and counterproliferation, the Trump administration's NPR will examine whether disarmament "is a realistic goal." As Ford put it, that question "is certainly among the conceptual space of options that we're exploring now."

Those statements are extremely troubling. If the United States fails to reaffirm its commitment to nuclear disarmament, it would further damage the NPT, which is already fraying because the nuclear weapon states are not living up to their commitments to eliminate these weapons. Notably, non-nuclear weapon states, frustrated by the lack of progress, successfully negotiated a legally binding treaty—which was adopted by the United Nations in July— that makes illegal the development, testing, production, manufacture, or stockpiling of nuclear weapons.

"For the United States, nuclear weapons are a liability, not an asset," says Gronlund. "With this in mind, we're urging the administration to take steps forward by rejecting Cold War–era policies that make us less safe." {**C**}



In many rural communities, like Isle de Jean Charles in Louisiana (pictured here), flooding not only damages homes but also makes roads unpassable, keeping residents from getting to their jobs.

Sounding the Alarm on Sea Level Rise

(continued from p.11)

DISTURBING LONGER-TERM TRENDS

Analyzing flooding in the latter half of this century, from 2060 to 2100, UCS identified three disturbing trends. First: by midcentury, large chronically flooded zones will emerge in cities and towns that seldom or never flood today, including several West Coast cities such as Alameda and San Mateo, California.

Second: flooding projections for cities and towns begin diverging starkly depending on a moderate or high rate of sea level rise. Under a moderate rate, nearly 500 communities will be chronically inundated by 2100. That number increases to 670 under a higher rate.

"If we cut carbon emissions extensively, and sea levels then rise less quickly, we could save ourselves a lot of pain," Caldas says. "But left unchecked, sea level rise will affect a much greater number of coastal communities, and a greater land area within them."

Third: chronic flooding begins to profoundly affect dozens of major metropolitan areas. Among many other cities, large portions of Boston, Fort Lauderdale, New Haven, Newark, Oakland, and four of New York City's five boroughs will be subject to chronic inundation in the moderate and worst-case scenarios.

"I admit I was stunned by these results," says Spanger-Siegfried. "The economic, cultural, and social consequences of losing 10 percent of Manhattan's land alone would be felt worldwide."

Moving perhaps hundreds of thousands of Americans away from regular disruptive flooding, constructing defensive measures against such flooding, or some combination of both, would cost billions of dollars, she says. It would exact a more personal toll as well, as the emotional strain of abandoning a cherished home to rising water is multiplied thousands of times over.

"We need to recognize that we could be headed for an unprecedented federal crisis, with so many communities needing assistance at the same time," says Spanger-Siegfried. "And that's just focusing on the economic side. Culturally, historically—so much is under threat."

PREVENTION, ADAPTATION, RETREAT

The UCS analysis aims to offer communities an accurate assessment of what to expect in the years ahead. It also lays out a best-case scenario for preventing the gravest of these consequences. Our scientists and analysts found that extensive reductions in global warming emissions, coupled with a slower pace of ice melt, could spare hundreds of American coastal cities and towns from disruptive flooding. The report also provides recommendations for coastal communities and their residents, and governments at all levels, to respond to the slow infiltration of the seas effectively and equitably.

As affected communities approach the threshold of chronic inundation, they'll confront difficult questions: should they stay in their homes and try to cope? Should they invest in measures like pumps, or raising homes and businesses to keep the water out? Or should they leave altogether? These questions reach beyond simple logistics to Americans' identities, their cultures,

Hundreds of communities will be threatened with retreat from flooded areas within the next few decades.

their lives and livelihoods. And many who lack the resources to move, or to modify their homes to adapt to flooding, will not have the luxury of even these difficult choices.

An example of managed retreat, says Spanger-Siegfried, is when the state of New York following Hurricane Sandy offered favorable buyout terms to some 300 homeowners in Staten Island whose homes were at risk of further flooding. The terms were accepted, and several oceanfront neighborhoods are now empty, their ex-residents living on higher, safer ground elsewhere.

Spanger-Siegfried also points to commonsense policies such as restricting development in areas that are expected to face chronic flooding. "There's no magic bullet that will work for every community," she says. "But communities can use this information

THANK

to put policies in place that can help more people cope."

Any policy measures taken—for defense, adaptation, or retreat—must explicitly help the communities with the fewest resources to act, Caldas says. "People of color and lowerincome folks can get left behind during storm recovery," she says. "Relief money often goes to the communities that need it the least. It's a disturbing pattern."

ADVICE FOR COASTAL DWELLERS

To learn when your community might reach the threshold of chronic inundation, you can visit the interactive map UCS created to accompany *When Rising Seas Hit Home* at *www.ucsusa.org/RisingSeasHitHome*. The full report, which includes recommendations for smart, effective policies to respond to sea level rise–induced flooding, is available for download; you can also read about Americans who are already experiencing disruptive flooding, and what they're doing about it.

If your community is at risk, UCS urges you to contact your local, state, and federal elected officials and make a case for investing in science-based adaptation measures, and for federal action on global warming emissions. You can also ask what your city or town's long-term and short-term plans are for managing rising seas and disruptive flooding. If your community is on the UCS flooding map and has no plan in place, ask to meet with your elected officials and local planning committee.

"The science is clear: Americans can count on the fact that sea level rise will reshape many of our coastal communities," says Spanger-Siegfried. "Most of us who'll be affected still have time. We must use it to plan wisely." {C}

"Your support has allowed me to speak with communities coping with sea level rise to meet with real people and learn from their stories."

DAMIEN JONES

EQUITY AND JUSTICE OUTREACH SPECIALIST, UCS CLIMATE AND ENERGY PROGRAM

Keeping Alive the Goals and Spirit of the Paris Climate Agreement

(continued from p.2)



Then-UN Secretary General Ban-Ki Moon (center) and other dignitaries celebrate the adoption of the Paris Climate Agreement in December 2015.

The move is also deeply unpopular at home. Fully 7 in 10 Americans support US participation in the Paris Agreement, including some 57 percent of Republican voters according to one does nothing to boost the economy or create US jobs. The fact is, more than 3 million people work in clean energy in America, far more than the approximately 65,000 coal miners

We're forging ahead on clean energy despite President Trump's reckless decision to withdraw from the Paris climate accord.

recent poll. Another poll shows that Trump supporters overwhelmingly support renewable energy, with 84 percent supporting the further expansion of solar power in the United States.

Equally important and contrary to what President Trump says, the withdrawal from the Paris Agreement President Trump claims (falsely) will benefit from his action. The solar and wind industries are creating jobs 12 times faster than the rest of the US economy, and the Bureau of Labor Statistics lists wind energy technician as the fastest-growing job in America through 2024, with an average salary in 2016 of \$52,000 per year.

"WE ARE STILL IN"

There is an unintended silver lining to President Trump's reckless decision. In reaction, an extraordinary and growing number of governors, mayors, businesses, investors, and universities from across the country, representing the broadest cross section of the American economy, have declared that they will continue their efforts to meet carbon reduction goals and help ensure the United States remains a global leader in reducing carbon emissions. So far, the "We Are Still In" coalition includes leaders from 125 cities, nine states, 902 businesses and investors, and 183 colleges and universities. Participating cities and states alone represent 120 million Americans and contribute \$6.2 trillion to the US economy.

UCS is working closely with many of these signatories. We are launching "swing for the fences" initiatives to show states the path toward greater ambition on climate, such as a regional cap-and-trade program for transportation emissions in the Northeast, and the modernization of our aging electricity grids to unleash the full potential of renewable energy. These and other efforts build off the renewable energy revolution that is now taking hold in all parts of the country, as we documented in our recent *Clean Energy Momentum* report.

President Trump may be abdicating a leadership role for the United States on action to address the urgent issue of climate change, but we're forging ahead nonetheless as the clean energy revolution continues. Even the president's wrecking ball can't demolish that. {C}

Ken Kimmell is president of UCS.

Why Is the EPA Delaying the Ozone Rule?

By Gretchen Goldman



When Environmental Protection Agency (EPA) Administrator Scott Pruitt recently announced a one-year delay on a new rule limiting ground-level ozone pollution the main ingredient in smog—he cited pation." Really?

"insufficient information." Really?

As an air quality scientist, I've closely studied the data on ground-level ozone pollution and health and I can assure you we are standing on solid ground when it comes to the ozone rule.

In keeping with a vast body of scientific evidence, the rule was tightened in 2015 to allow no more than 70 parts per billion (ppb) of ozone in the atmosphere (down from 75 ppb in 2008). Ozone has been linked to a variety of health effects including emphysema and asthma attacks, and cities across the country continue to experience unsafe levels—especially as temperatures rise from climate change.

Here's a quick rundown of just how robust the science is on the public health threat posed by groundlevel ozone pollution. As part of the update to the ozone standard, the EPA's Integrated Science Assessment on the rule runs to 1,251 pages. This peer-reviewed document, produced by EPA scientists, surveys the current scientific literature on ozone (including one of my own papers) and finds several "causal" and "likely causal" relationships between ozone pollution and health impacts including cardiovascular problems, total mortality, and longterm respiratory effects. Of note, the



The EPA's delay of a new rule on ground-level ozone pollution—the main ingredient in smog—will allow more days with unhealthy air quality in Los Angeles (above) and many other US locales.

report identifies "a very large amount of evidence spanning several decades [that] supports a relationship between exposure to O₃ [ozone] and a broad range of respiratory effects."

The Clean Air Science Advisory Committee (CASAC), a group of external experts the EPA relies on, concluded that the standard should be tightened. In CASAC's letter to the EPA administrator, the science advisors recommended a range of 60 to 70 ppb for the standard, while also noting that 70 ppb—while included in the recommended range—would *not* provide an "adequate margin of safety," as the Clean Air Act mandates. CASAC actually proposed that the ozone rule be tightened to this range *back in 2007*. The bottom line is this: the law specifically requires the EPA to set an ozone standard that protects public health with an adequate margin of safety *based on science and science alone*. The agency is legally prohibited from considering economic arguments. So, Administrator Pruitt, I have to ask: What is your definition of "insufficient"? Because I have looked at the science, and I can tell you the evidence is clear that, contrary to what you claim, we have more than sufficient information to act. {C}

Gretchen Goldman is an atmospheric scientist and the research director for the Center for Science and Democracy at UCS. Read more from Gretchen on our blog, The Equation, at http://blog.ucsusa.org.

"Smart" Charging Means Better Electric Cars and Cleaner Energy

By Peter O'Connor



Electric cars are good for the environment, fun to drive, and increasingly affordable to own. They are also a crucial piece of a more sustainable transportation system. But future widespread use of

electric cars presents a challenge: what will happen to the electricity grid if drivers get home from work and want to charge their cars at the same time?

A key piece of the answer could be a practice called smart charging that would deploy a range of technological and regulatory advances that encourage charging when it is best for the grid. UCS is helping develop best practices for smart charging, identifying ways for states, utilities, automakers, and charging station providers and other companies to better integrate electric cars and renewable energy into the grid—with significant environmental and economic savings.

Smart charging systems can automatically vary the time or rate at which electricity flows into the vehicle. By coordinating electric vehicle charging with periods of cheap and abundant renewable energy, utilities can match supply and demand, and reduce system costs. In some areas this may mean charging cars in the middle of the day, when solar panels are most productive; in others, optimal charging may occur in the middle of the night, powered by the wind. In the future, two-way "vehicle-to-grid" power exchange could become more common, with vehicles being charged by renewable energy when it is abundant,



and providing surplus electricity back to the grid when it is needed.

Some of the key findings from our work on smart charging: it's a viable strategy, offering real-life benefits; pricing electricity based on supply and

Smart charging sends power to an electric vehicle when it's best for the grid.

demand can help avoid costly peak-hour charging; and electric vehicles offer grid operators a realistic means of storing clean energy for times of high demand. In short, smart charging of electric vehicles has a key role to play in grid modernization initiatives happening around the country. Where the timing and power of electric vehicle charging automatically adjust to meet drivers' needs *and* grid needs, adding these vehicles to the grid can reduce total system costs and pollution.

For more details, view the report *Charging Smart* at *www.ucsusa.org/ smartcharging.* {**C**}

Peter O'Connor is an energy analyst in the UCS Climate and Energy Program; he was formerly a Kendall Fellow at UCS focusing on the integration of solar power and electric vehicles into the electricity system. Read more from Peter on our blog, The Equation, at http://blog.ucsusa.org.



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