

Earth Day 50th Anniversary

Timeline from 1720 to 2020

Highlighting Advances in Sustainability
and Green Chemistry

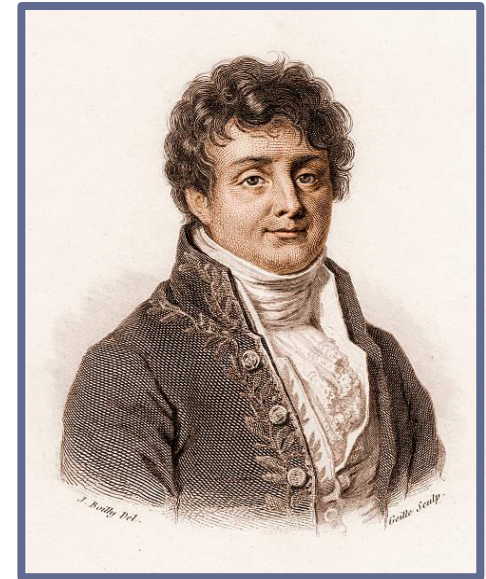


1720

In India, hundreds of Bishnois Hindus of Khejadali are killed trying to protect trees from the Maharaja of Jodhpur, who needed wood to fuel the construction of his palace. This event will come to be considered the origin of the 20th century Chipko movement.

1824

French scientist Jean Baptiste Joseph Fourier describes the atmosphere as the planet's insulating blanket. Fourier is the first to use the term "greenhouse effect" to describe how the gases maintain Earth's temperature despite being so far from the sun.



Jean Baptiste Joseph Fourier

1820

World human population reaches 1 billion.



1856

Though often attributed to Irish physicist John Tyndall, it was actually the female American scientist Eunice Newton Foote who first theorized that increases in carbon dioxide in the atmosphere could impact Earth's temperatures.



Drawing by Carlyn Iverson, NOAA Climate.gov.

1872

The term "acid rain" is coined by Robert Angus Smith in the book "Air and Rain."

1876

The British River Pollution Control Act makes it illegal to dump sewage into a stream.

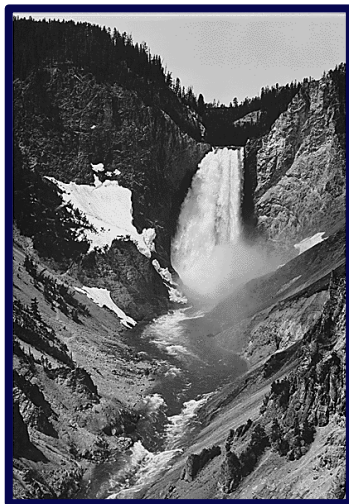
1887

Ellen Swallow Richards, the first woman to earn a chemistry degree in the United States, conducted an unprecedented survey of bodies of water accessed for drinking water. Her work led to the development of water treatment and sewage treatment plants.

1896

Swedish scientist, Svante Arrhenius, claims that burning coal will cause a global warming effect due to an increase in carbon dioxide in the atmosphere.

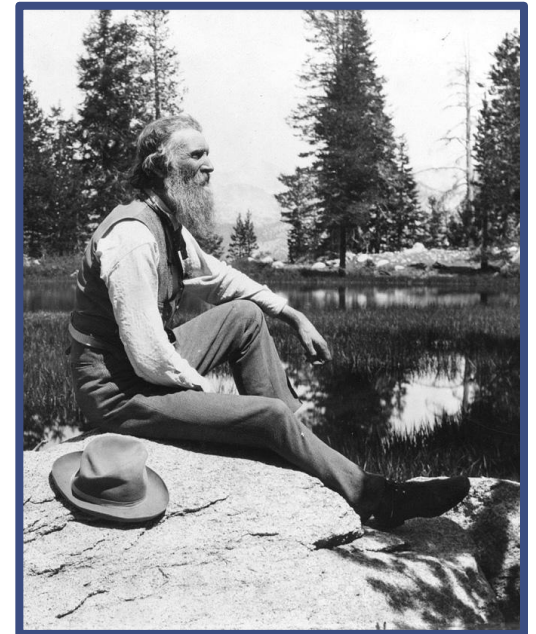
The world's first national park, Yellowstone National Park, is established, signed into law by U.S. President Ulysses S. Grant on March 1, 1872.



"Yellowstone Falls" by Ansel Adams, 1933-1942; Records of the National Park Service; Record Group 79; National Archives.

1892

John Muir, a Scottish-American naturalist, founds the Sierra Club.



1903

U.S. President Theodore Roosevelt creates the first National Bird Preserve, which will serve as the beginning of the Wildlife Refuge System, on Pelican Island, Florida.



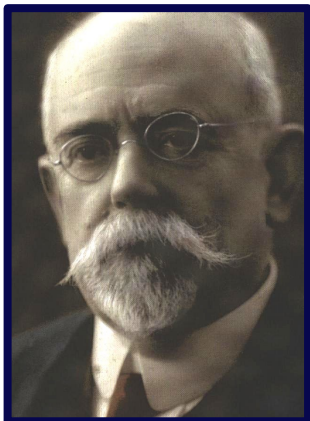
1909

U.S. President Theodore Roosevelt convenes the North American Conservation Conference, held in Washington, D.C., and attended by representatives of Canada, Newfoundland, Mexico and the United States.

1917

Alexander Graham Bell, a Scottish scientist best known as the inventor of the telephone, writes, "The unchecked burning of fossil fuels would have a sort of greenhouse effect." This statement used the terminology from Fourier from 1824, the claims of Foote in 1856 and Arrhenius in 1896, and now connects this effect to all fossil fuels.

Some 7300 hectares of land in the Lake District of the Andes foothills in Patagonia are donated by Francisco Moreno as the first park, Nahuel Huapi National Park, for what will eventually become the National Park System of Argentina.



Francisco Moreno

1914

A group of Swiss scientists and conservationists convince the government of Switzerland to set aside 14,000 hectares (roughly 34,600 acres) of land in the Swiss Alps as Europe's first national park.



www.flickr.com/photos/58869428@N05/18179255064

1923

In New Zealand, the Native Bird Protection Society (later the Royal Forest and Bird Protection Society, or Forest & Bird) is created in response to the devastation of Kapiti Island by livestock.



1930

World human population reaches 2 billion.

1930-1940

Fueled by drought and poor land practices, the Dust Bowl brings widespread land degradation across the North American prairie.



Image by [Wikilimages](#) from [Pixabay](#)

1933

The Convention Relative to the Preservation of Fauna and Flora in Their Natural State is signed by Belgium, Egypt, Italy, Anglo-Egyptian Sudan, Union of South Africa, the United Kingdom, British India, Tanganyika and Portugal.

1960

World human population reaches 3 billion.



1961

In what is now the of KwaZulu-Natal province of South Africa, Southern white rhinoceros were tranquilized and transported across southern Africa to allow for safe breeding to save this species from extinction.

1964

Norman Borlaug takes a position as the director of the International Wheat Improvement Program in Texcoco, Mexico. The program leads to the Green Revolution.

1968

UNESCO hosts the Paris Biosphere Conference, which will result in the creation of the Man and the Biosphere Programme.

After decades of industrial waste dumping, Ohio's Cuyahoga River catches fire. The image of this fire in TIME Magazine brings a new public awareness to the human impact of pollution on our environment.

Activists mobilize in France to preserve the Vanoise National Park in the Alps from a touristic project. The park is created three years later, in 1963, as the first French natural park.

1967

1967 – American Chemical Society (ACS), a professional association for chemists, launches "[Environmental Science & Technology](#)" journal, an authoritative source of information for professionals in a wide range of environmental disciplines.

1969

The Santa Barbara oil spill dumps millions of gallons of crude oil off the coast of California, causing a 35-mile oil spill.

1962

Rachel Carson publishes "Silent Spring," a seminal work that catapults the environmental dangers of indiscriminate pesticide use to a national stage.

ENVIRONMENTAL
Science & Technology

April 22, 1970

World's first Earth Day:

Millions gather across the United States for the first Earth Day, organized by Gaylord Nelson, former senator of Wisconsin, and Denis Hayes, a Harvard graduate student.



U.S. Environmental Protection Agency is established. President Richard Nixon proposes establishment of the EPA on July 9, 1970, and the agency began operation on December 2, 1970.

United Nations Ramsar Convention on Wetlands is signed in Ramsar, Iran. The international agreement to protect wetlands has 160 member-nations today and helps to protect nearly 2,000 wetland areas worldwide.

1972

The U.N. Conference on the Human Environment — held in Stockholm, Sweden, in early June — is the first of a series of the world environmental conferences.

The Clean Water Act is enacted across the U.S. to restore and protect clean and healthy waters. The act is a response to increasing awareness of and public concern for the condition of the environment and more specifically, U.S. waters.

1973

World Conservation Union (IUCN) meeting drafts the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Endangered Species Preservation Act passes in U.S. Congress with a House vote of 390–12. The act broadens and strengthens protections for plant and animal species listed as threatened or endangered in the U.S. The legislation becomes one of the most effective tools to protect at-risk species and their habitats across the country.

1971

International environmental organization Greenpeace is founded in Vancouver, Canada. The organization will go on to develop national and regional offices in 41 countries worldwide.



Image credit: Greenpeace
www.greenpeace.org/philippines/history-and-victories/

1970

Caspian Tiger goes extinct.

United Nations Environment Programme is founded as a result of the Conference on the Human Environment.

The Organization of the Petroleum Exporting Countries (OPEC) announces oil embargo against United States.



1974

Congress passes the Safe Drinking Water Act to ensure and protect the quality of Americans' drinking water.



Photo of the Three Mile Island plant site
Image credit www.flickr.com/photos/nrcgov/

1978

Brominated flame retardants replace PCBs as the major chemical flame retardant. Swedish scientists will notice these substances accumulating in human breast milk in 1998, with the first ban on use in the European Union in 2004.

1979

Three Mile Island accident, the most significant U.S. commercial nuclear disaster to date, occurs near Harrisburg, Pennsylvania.

1977

Through the Tbilisi Declaration, the world's first intergovernmental conference on environmental education was organized by the United Nations Education, Scientific and Cultural Organization (UNESCO) in cooperation with the U.N. Environment Programme in Tbilisi, Georgia.

Love Canal contamination is revealed.

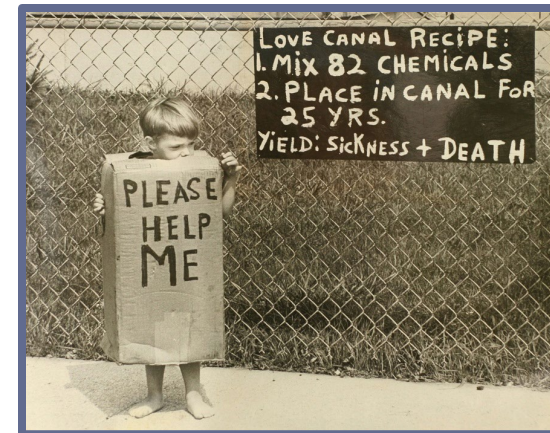


Image by [bullfrogcommunities](#)

1982

Attempts to build a PCB landfill in an African American neighborhood in Warren County, N.C. result in demonstrations and trigger a nationwide movement for environmental justice. Environmental Justice activists protest polychlorinated biphenyl (PCB) landfill in Warren County, NC. Here, Dr. Benjamin Chavis coins the term “environmental racism.”



Image courtesy of [Ricky Stillely](#) and [NC DNCR](#)

1984

US President Ronald Reagan [says in his State of the Union Address](#), “Preservation of our environment is not a liberal or conservative challenge, it’s common sense.”

1983

Australia is hit by extreme weather phenomena and devastation: The Melbourne dust storm hits the capital of Victoria, Australia, with a dust cloud more than 1,000 feet high, stripping about 50,000 tons of topsoil from drought-afflicted areas of eastern Australia. A week later, the Ash Wednesday bushfires became the deadliest bushfire in Australian history to date, killing 47 in Victoria and 28 in South Australia.

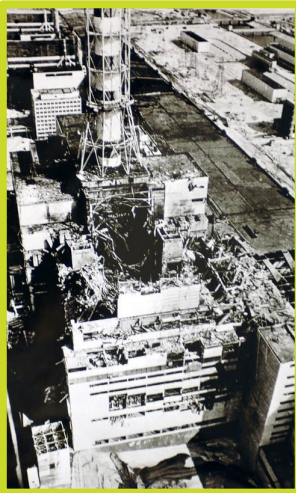


Photo of Dust Storm Mungerannie South Australia
Image credit www.flickr.com/photos/57768042@N00/4400643804

[Bhopal disaster](#). Union Carbide Co. (Dow Chemical) fertilizer plant leaks methyl isocyanide in Indian town of Bhopal. The death toll: over 3,700 dead immediately, another 8,000 die within a few weeks and yet another 8,000 die of chronic effects.

1985

Antarctic ozone hole is discovered.



April 26, 1986, The Chernobyl disaster
Image credit

www.flickr.com/photos/iaea_imagebank/5613115146

1986

The Chernobyl disaster, the world's worst nuclear power accident, occurs at a plant in the Ukraine.

1988

The Intergovernmental Panel on Climate Change (IPCC) is established by two U.N. organizations, the World Meteorological Organization (WMO) and the United Nations Environment Programme to assess the "risk of human-induced climate change."

1989

The Montreal Protocol on Substances that Deplete the Ozone Layer enters into force on January 1, 1989. The international treaty phased out the many substances responsible for ozone depletion. Since 1987, the protocol has undergone five revisions in 1990 (London), 1992 (Copenhagen), 1995 (Vienna), 1997 (Montreal), and 1999 (Beijing).

Exxon Valdez disaster spills 11 million gallons of crude oil into Alaska's Prince William Sound, covering 1,300 miles of coastline in March 1989. The Exxon Valdez oil spill was the worst in U.S. history until the Deepwater Horizon oil spill in 2010.

A team of Russian scientists at the Vostok Station in Antarctica drill an ice core about 2 kilometers deep. For the first time, scientists could explore nearly 150,000 years of climate history.

1987

World human population reaches 5 billion.

Environmentalist Chico Mendes was assassinated. Mendes worked for decades to protect the people and ecosystems of the Amazon Rainforest and was constantly under threat from logging industry supporters.

The Goldman Environmental Prize is created by civic leaders and philanthropists Richard N. Goldman and Rhoda H. Goldman.



1990

Earth Day goes global, with events organized in more than 140 nations.

The IPCC First Assessment Report is released. The landmark report emphasized the importance of climate change as a global challenge requiring a cooperative global solution. The report played a major role in the creation of the United Nations Framework Convention on Climate Change (UNFCCC), the key international body to address climate change and compel international climate action.

1992

BHC Company (now BASF) changes the way they manufacture ibuprofen, a common anti-inflammatory painkiller. This new process is a green chemistry success story because it minimizes waste, uses fewer resources, saves energy, and is better for the environment.

World Oceans Day begins at the Earth Summit in Rio de Janeiro. Today, World Oceans Day is marked every year on June 8.

The metaphor “ecological footprint” is coined by Canadian professor William Rees to measure humanity's ecological impact on the environment.

European Environment Agency is established by EEC Regulation 1210/1990. The agency, which is headquartered in Copenhagen, Denmark, becomes operational in 1994.



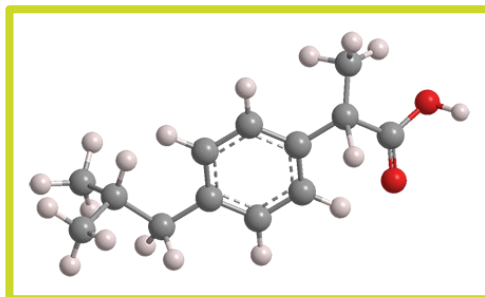
The Earth Summit, held in Rio de Janeiro, results in the adoption of three major Rio Conventions: The United Nations Framework Convention on Climate Change, the U.N. Convention on Biological Diversity, and the U.N. Convention to Combat Desertification.

National Environmental Education Act is established in the U.S. The act provides resources to local education institutions and educational organizations to support and improve environmental study and training.

The Canadian government closes all eastern seaboard fishing grounds due to insufficient recovery of the stock.

1993

Ice cores from Greenland show that past climate changes have occurred in as little as 10 years. The finding debunked previous hypotheses that climate changes only happened on very slow, long timeframes.



1994

The first symposium based on sustainability and chemistry, called "Benign by Design: Alternative Synthetic Design for Pollution Prevention," was held in Chicago and sponsored by the ACS Division of Environmental Chemistry.



2001

The Green Chemistry Institute becomes a part of the ACS.

1997

Chemists develop and register spinosad, a highly selective, environmentally-friendly insecticide, for use on crops in the United States.

Dr. Joe Breen, a retired 20-year staff member of the EPA, and Dr. Dennis Hjerresen co-found the Green Chemistry Institute (GCI) as an independent nonprofit dedicated to advancing green chemistry.

1995

The 1994 Nobel Prize in Chemistry is awarded to Paul Crutzen, Mario Molina and F. Sherwood Rowland for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone.

The University of Massachusetts at Boston establishes the field's first Green Chemistry Ph.D. program.

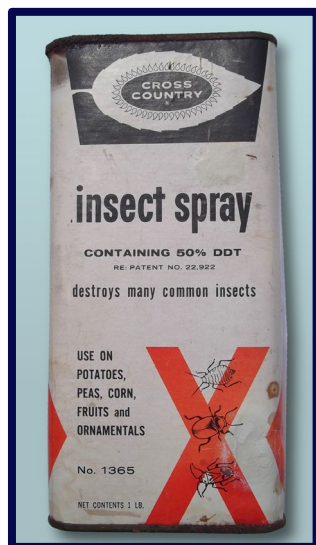
1998

Paul Anastas and John C. Warner co-author the groundbreaking book, Green Chemistry: Theory and Practice in 1998. The 12 Principles of Green Chemistry declare a philosophy that motivates academic and industrial scientists at the time and continues to guide the green chemistry movement.

The US EPA receives support from President Bill Clinton to establish an annual awards program highlighting scientific innovations in academia and industry that advanced Green Chemistry, thus creating the annual Presidential Green Chemistry Challenge Awards.



After it was discovered to be dangerous to wildlife and the environment, DDT (dichlorodiphenyltrichloroethane) is banned as a pesticide worldwide under the Stockholm Convention.

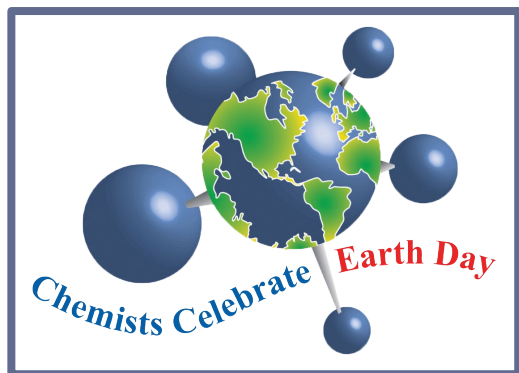


2004

The U.S. Federal Bureau of Investigations (FBI) initiates Operation Backfire, an anti-terrorist law enforcement operation against "Eco Radicals."

2003

ACS joins the Earth Day celebration and begins hosting annual events to increase the public's awareness of green chemistry.



The 2004 Indian Ocean earthquake and tsunami kills nearly a quarter of a million people.



Wangari Maathai wins Nobel Peace Prize for her work planting trees around Kenya, the first African woman to receive this distinction. Maathai was also the first female scholar from East and Central Africa to take a doctorate (in biology) and the first female professor ever in her home country of Kenya.

2005

The Kyoto Protocol enters into force on February 16, following ratification by Russia in November 2004.

The European Union Emissions Trading System is launched to reduce greenhouse gas emissions through a "cap and trade" program.

Hurricanes Katrina, Rita and Wilma cause widespread destruction and environmental harm to coastal communities in the U.S. Gulf Coast region.



2007

The IPCC releases its Fourth Assessment Report.



Power Shift 2007, the first National Youth Climate Conference, is held in Maryland and Washington, D.C. The event saw more than 5,000 youth converge in Washington, D.C., to build the movement, lobby Congress and deliver a statement on youth perspectives on global warming.

Scientists report that Arctic sea ice is melting far faster than originally predicted.

The 2007 Nobel Peace Prize is awarded jointly to the IPCC and U.S. Vice President Al Gore "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change."

The UNFCCC develops an initiative called REDD+ which focuses on mitigation solutions for reducing carbon emissions for countries experiencing rapid deforestation.



2011

Western black rhino goes extinct due to poaching.



Black Rhino calf - Kufara

Taronga Western Plains Zoo - Dubbo - NSW

www.flickr.com/photos/bfra07/4641824922

2013

Sea winds bring massive air pollution from mainland China to Japan demonstrating that major national polluters are not the only ones who incur the damaging impacts.

ACS
Sustainable
Chemistry & Engineering

ACS launches the journal, "ACS Sustainable Chemistry and Engineering," to address challenges of sustainability in the chemical enterprise and to advance principles of Green Chemistry and Green Engineering.

United Nations designates October 31, 2011, The Day of Seven Billion to mark the day that world human population reached 7 billion people.

2014

IPCC releases its Fifth Assessment Report on the state of the climate, its impacts and the global solutions for climate mitigation and adaptation.



2015

At COP 21 on December 12, 2015 195 countries adopt the Paris Agreement, the world's first international agreement to keep total anthropogenic global warming to "well below" 2 degrees Celsius.



Photo credit: US State Department
www.flickr.com/photos/statephotos/23076185424

The Paris Agreement enters into legal force in November 2016, just 11 months from its adoption.

2018

The Intergovernmental Panel on Climate Change releases its Special Report on 1.5 Degrees of Global Warming, which warns that the world has just twelve years to halve its emissions to avoid the worst impacts of climate change.

2016

The Paris Agreement is signed by 174 countries and the European Union in a ceremony at United Nations headquarters on Earth Day.



Photo credit: US State Department
www.flickr.com/photos/statephotos/26307463260

2017

U.S. President Donald Trump announces his intent to withdraw the United States—the world's second-largest emitter—from the Paris Agreement.



Photo Credit: Anders Hellberg/ Anderspangpang
via Wikimedia Commons

2019

The IPCC releases two landmark reports on climate impacts on land and agriculture, and oceans and the cryosphere.

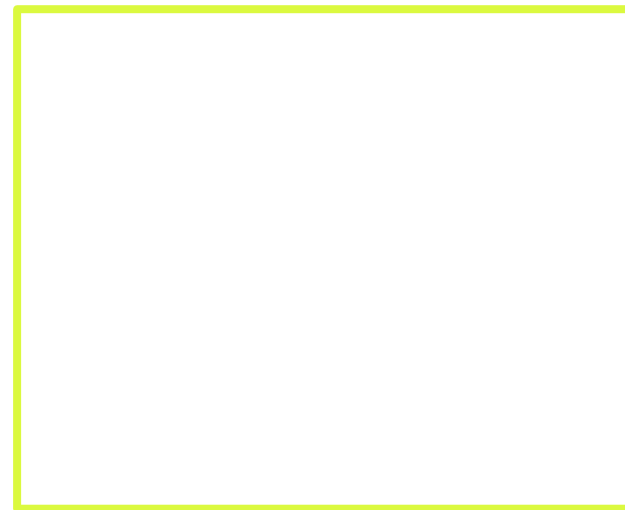
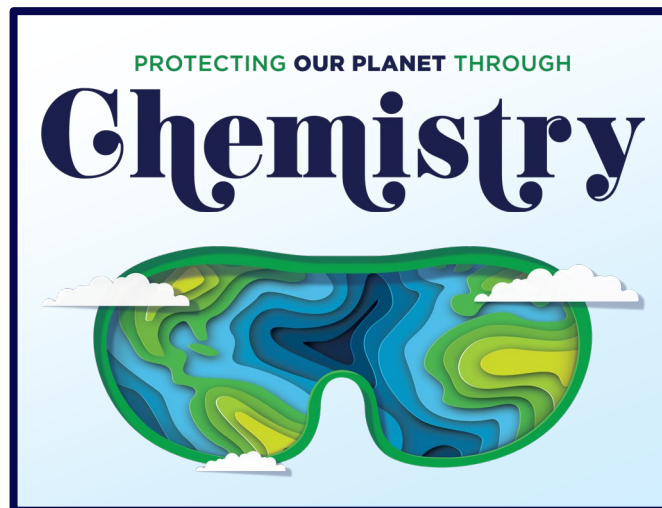
16-year-old Greta Thunberg strikes outside of Swedish Parliament to protest political inaction on climate change. Thunberg's strikes further the growing youth climate movement through the Fridays for Future youth strikes worldwide

April 22, 2020

Earth Day marks 50 years with global mobilizations to activate more than a billion people worldwide.

April 19-25, 2020

American Chemical Society hosts Chemists Celebrate Earth Week with the theme, "Protecting Our Planet through Chemistry," to motivate 152,000 members and chemists to engage the public in green chemistry.



You can determine the future — add your events for the future of our planet!

Add your own events in the boxes above as we work together to build a cleaner, safer and more just world for all.



American Chemical Society Celebrates 50 Years of Earth Day

Founded in 1876, the American Chemical Society is a nonprofit organization chartered by the U.S. Congress. Our mission is to advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people. As part of that mission, we organize Chemists Celebrate Earth Week, an annual community-based program to communicate the positive role that chemistry plays in the world.

Learn more about how you can help to be part of history at www.acs.org/ccew.