



Independent Statistics & Analysis

U.S. Energy Information
Administration

Annual Energy Outlook 2021

with projections to 2050

Narrative



The *Annual Energy Outlook* explores long-term energy trends in the United States

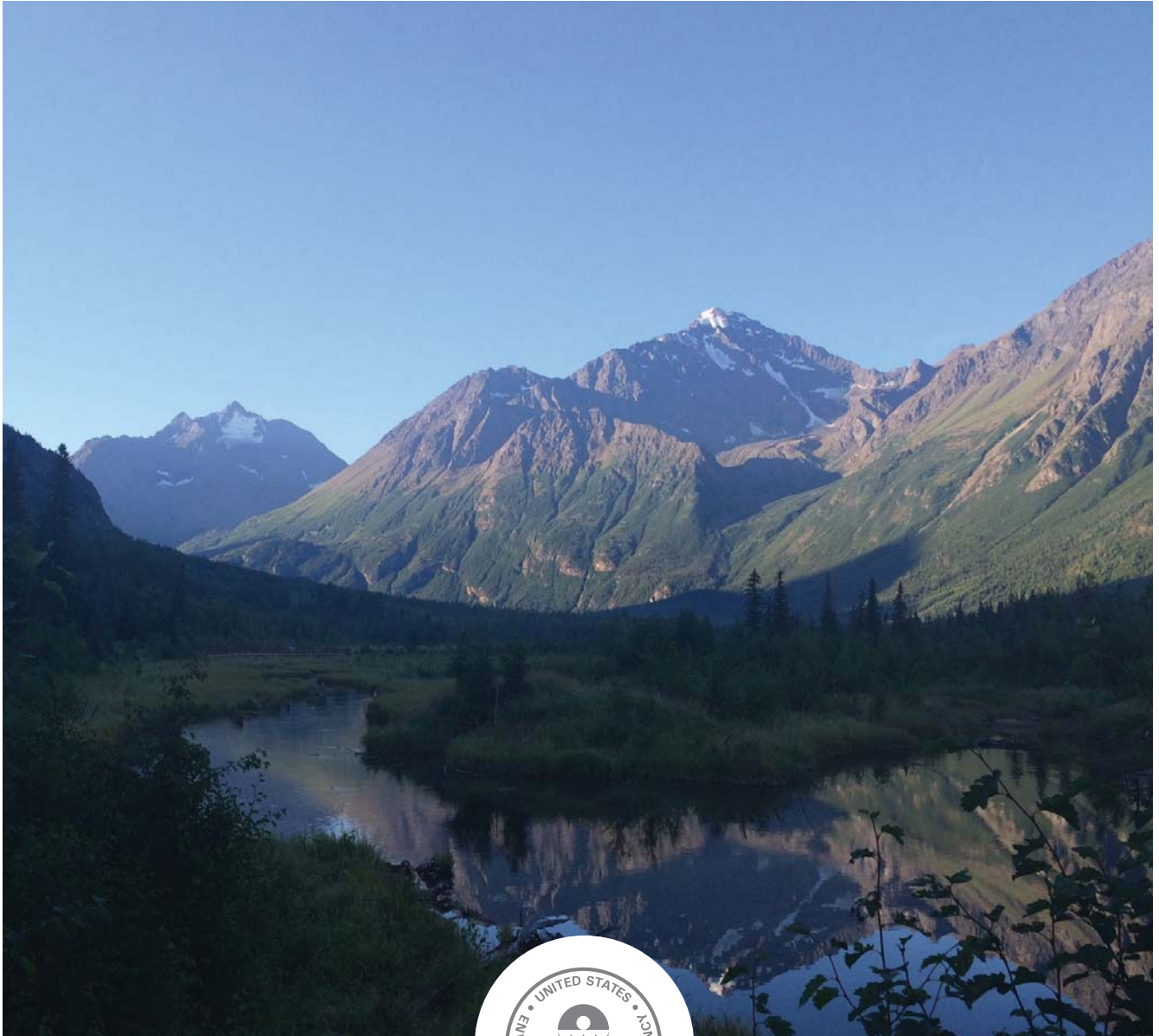
- Projections in the *Annual Energy Outlook 2021* (AEO2021) are not predictions of what will happen, but rather, they are modeled projections of what may happen given certain assumptions and methodologies. By varying those assumptions and methodologies, AEO2021 can illustrate important factors in future energy production and use in the United States.
- Energy market projections are uncertain because many of the events that shape energy markets—as well as future developments in technologies, demographics, and resources—cannot be foreseen with certainty. To illustrate the importance of key assumptions, AEO2021 includes a Reference case and side cases that systematically vary important underlying assumptions.
- The U.S. Energy Information Administration (EIA) develops the AEO by using the National Energy Modeling System (NEMS), an integrated model that captures interactions of economic changes and energy supply, demand, and prices.
- The AEO is published to satisfy the Department of Energy Organization Act of 1977, which requires EIA's Administrator to prepare annual reports on trends and projections for energy use and supply.

What is the AEO2021 Reference case?

- The AEO2021 Reference case represents EIA's best assessment of how U.S. and world energy markets will operate through 2050, based on key assumptions intended to provide a baseline for exploring long-term trends.
- The Reference case serves as a reasonable baseline case that can be compared with the side cases that include alternative assumptions.
- EIA based the economic and demographic trends reflected in the Reference case on the current views of leading economic forecasters and demographers. For example, the Reference case projection assumes improvement in known energy production, delivery, and consumption technologies.
- The Reference case generally assumes that current laws and regulations that affect the energy sector, including laws that have end dates, remain unchanged throughout the projection period. This assumption enables EIA to use the Reference case as a benchmark to compare with alternative policy-based cases.
- The potential effects of proposed legislation, regulations, or standards are not included in the AEO2021 cases.

What are the side cases?

- Global market balances, primarily influenced by factors that are not modeled in NEMS, will drive future oil prices. In the AEO2021 High Oil Price case, the price of Brent crude oil, in 2020 dollars, reaches \$173 per barrel (b) by 2050, compared with \$95/b in the Reference case and \$48/b in the Low Oil Price case.
- Compared with the Reference case, the High Oil and Gas Supply case reflects lower costs and greater resource availability for oil and natural gas in the United States, which allows for more production at lower prices. The Low Oil and Gas Supply case assumes fewer resources and higher costs.
- The High Economic Growth case and Low Economic Growth case address the effects of economic assumptions on the energy consumption modeled in the AEO2021. The two cases assume compound annual growth rates for U.S. gross domestic product of 2.6% and 1.6%, respectively, from 2020 to 2050, compared with 2.1% per year growth in the Reference case.
- The High Renewables Cost case and the Low Renewables Cost case examine the sensitivities surrounding capital costs for renewable electric power generating technologies. Capital cost reduction for an electric power generating technology is assumed to occur from learning by doing. The High Renewables Cost case assumes no cost reduction from learning for any renewable technologies. The Low Renewables Cost case assumes higher learning rates for renewable technologies through 2050, resulting in a cost reduction of about 40% from the Reference case by 2050.



Working Together

FY 2018-2022 U.S. EPA Strategic Plan

February 2018 (Updated: September 2019)



Introduction

Goal 1

A Cleaner, Healthier Environment:

Deliver a cleaner, safer, and healthier environment for all Americans and future generations by carrying out the Agency's core mission.

Goal 2

More Effective Partnerships:

Provide certainty to states, localities, tribal nations, and the regulated community in carrying out shared responsibilities and communicating results to all Americans.

Goal 3

Greater Certainty, Compliance, and Effectiveness:

Increase certainty, compliance, and effectiveness by applying the rule of law to achieve more efficient and effective agency operations, service delivery, and regulatory relief.

The U.S. Environmental Protection Agency (EPA) developed this *FY 2018-2022 EPA Strategic Plan* (the *Plan*) to: (1) deliver a cleaner, safer, and healthier environment for all Americans and future generations by carrying out the Agency's core mission; (2) provide certainty to states, localities, tribal nations, and the regulated community in carrying out shared responsibilities and communicating results to all Americans; and (3) increase certainty, compliance, and effectiveness by applying the rule of law to achieve more efficient and effective agency operations, service delivery, and regulatory relief. The *Plan* supports states, localities, and federally-recognized Indian tribes¹ by streamlining programs and processes, reducing duplication of effort, providing greater transparency and listening opportunities, and enabling the Agency to focus on its core mission.

EPA's senior managers will use this *Plan* routinely as a management tool to guide the Agency's path forward, tracking progress and assessing and addressing risks and challenges that could potentially interfere with EPA's ability to accomplish its goals. The three strategic goals established in the *Plan* are supported by strategic objectives and long-term performance goals² focused on advancing human health and environmental results over the next five years. These long-term performance goals are supported by annual performance goals included in the annual performance plans and budgets that EPA submits to Congress. The strategies and long-term performance goals in this *Plan* highlight key areas in which the Agency will make the most dramatic changes over the next five years and are not intended to address all ongoing programs. The annual performance plans and budgets, and supporting annual and operational measures, address a broader range of the Agency's work. In addition, the Agency will hold quarterly and monthly meetings to assess progress toward annual and long-term performance goals.

The EPA Administrator established two-year agency priority goals (APGs) for accelerating progress on EPA priorities. APGs reflect agency leadership's top near-term priorities for implementing performance improvement. EPA's APGs were selected from among the suite of long-term performance goals. EPA will support these priority goals by developing two-year implementation plans and reporting quarterly progress.

The *FY 2018-2022 EPA Strategic Plan* is supported by other, more detailed Agency plans in specific areas. For example, EPA's Human Capital Operating Plan details the

¹ Tribes include all federally-recognized tribes, including Alaska Native Villages (as issued by the Secretary of the Interior).

² Long-term performance goals are the measurable results the Agency is working to achieve over the life of the Plan and are supported by data quality records (DQRs), which provide details such as the methods of measurement and other important contextual information such as baselines. DQRs can be found at <https://www.epa.gov/planandbudget/results>.

FY 2018-2019 Agency Priority Goals

APG-1: Improve air quality by implementing pollution control measures to reduce the number of nonattainment areas. By September 30, 2019, EPA, in close collaboration with states, will reduce the number of nonattainment areas to 138 from a baseline of 166.

APG-2: Empower communities to leverage EPA water infrastructure investments. By September 30, 2019, EPA will increase by \$16 billion the non-federal dollars leveraged by EPA water infrastructure finance programs (Clean Water and Drinking Water State Revolving Funds and the Water Infrastructure Finance and Innovation Act).

APG-3: Accelerate the pace of cleanups and return sites to beneficial use in their communities. By September 30, 2019, EPA will make an additional 102 Superfund sites and 1,368 brownfields sites ready for anticipated use (RAU).

APG-4: Meet new statutory requirements to improve the safety of chemicals in commerce. By September 30, 2019, EPA will complete in accordance with statutory timelines (excluding statutorily-allowable extensions): 100% of required EPA-initiated Toxic Substances Control Act (TSCA) risk evaluations for existing chemicals; 100% of required TSCA risk management actions for existing chemicals; and 80% of TSCA pre-manufacture notice final determinations.

APG-5: Increase environmental law compliance rate. Through September 30, 2019, EPA will increase compliance by reducing the percentage of Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permittees in significant noncompliance with their permit limits to 21% from a baseline of 24%.

APG-6: Accelerate permitting-related decisions. By September 30, 2019, EPA will reduce by 50% the number of permitting-related decisions that exceed six months.

actions the Agency will execute to achieve its overarching human capital goals, and EPA's Information Technology/Information Management Strategic Plan will guide efforts to support and modernize the Agency's technology and data infrastructure. The EPA's workforce and reform efforts will support streamlining efforts to work more efficiently and effectively in the future. The many activities described in these plans align with and help position the Agency to achieve the strategic goals and objectives presented in this *Plan*.

EPA is also in the process of deploying a Lean management system specifically designed to deliver measurable results that align with this Plan. Lean is a set of principles and tools designed to identify and eliminate waste from processes while maximizing customer value and return on taxpayer investment. EPA will standardize and streamline processes to strengthen efficiency and quality to better meet mission goals and objectives. Under the Administrator's leadership, EPA will become a Lean organization.

Strategies to achieve EPA's goals and objectives are also informed by gathering evidence related to environmental problems and evaluating the effectiveness of the strategies that the programs use to address them. Examples of recent evidence and evaluation efforts used to develop this *FY 2018-2022 EPA Strategic Plan* and a preliminary list of future planned efforts can be found at <https://www.epa.gov/planandbudget/strategicplan>.

Associations & Organizations

National: Air & Climate

- 1 Air & Waste Management Association**
 Koppers Building 412-232-3444
 436 Seventh Avenue, Suite 2100 800-270-3444
 Pittsburgh, PA 15219 Fax: 412-232-3450
 info@awma.org
 www.awma.org
 Professional development organization providing a forum for the exchange of information, networking, public education, and outreach to over 5,000 environmental professionals in 65 countries.
Founded: 1907
Stephanie Glyptis, Executive Director
Tracy Fedkoe, Director, Marketing
- 2 American Clean Skies Foundation**
 202-361-3701
 info@cleanskies.org
 www.cleanskies.org
 Independent non-profit works for cleaner energy in the transportation and electric power sectors. In 2019, the Foundation temporarily suspended further activities pending new funding.
Founded: 2007
- 3 American Meteorological Society**
 45 Beacon St 617-227-2425
 Boston, MA 02108-3693 Fax: 617-742-8718
 amsinfo@ametsoc.org
 www.ametsoc.org
 Professional organization disseminates information about the atmospheric, oceanic and hydrologic sciences.
Founded: 1919 13,000 members
Keith L. Seitter, Executive Director
Wendy Abshire, Director, Education
- 4 Center for Clean Air Policy**
 750 First St NE 202-408-9260
 Suite 1025 Fax: 202-408-8896
 Washington, DC 20002 ccap.org
 Climate and air quality think tank.
Founded: 1985
Allison Bender-Corbett, Executive Director
Stacey Davis, Director, Policy & Programs
- 5 Citizens' Climate Lobby**
 1330 Orange Ave 619-437-7142
 Suite 309 citizensclimatelobby.org
 Coronado, CA 92118
 Citizens' Climate Lobby is a non-profit, non-partisan, grassroots advocacy organization focused on national policies to address climate change.
Founded: 2007
Mark Reynolds, Executive Director
Don Addu, Program Director
- 6 Clean Air Council**
 135 S 19th Street 215-567-4004
 Suite 300 Fax: 215-567-5791
 Philadelphia, PA 19103 cleanair.org
 Seeks to protect and defend the right to a healthy environment through education, community initiatives, government intervention, and enforcement of relevant environmental laws.
Founded: 1967
Joseph Otis Minott, Executive Director
Eric Cheung, Deputy Director
- 7 Climate Institute**
 1225 New York Ave NW 202-552-0163
 Suite 800 info@climate.org
 Washington, DC 20005 climate.org
- 8 Conservation International**
 2011 Crystal Dr 703-341-2400
 Suite 600 800-429-5660
 Arlington, VA 22202 www.conservation.org
 CI promotes sustainable development and the conservation of earth's ecosystems as keys to solving climate change.
M. Sanjayan, Chief Executive Officer
- 9 Environment America**
 1543 Wazee Street 303-801-0581
 Suite 410 800-401-6511
 Denver, CO 80202 www.environmentamerica.org
 A nonprofit organization dedicated to educating the public on environmental issues through research reports, news conferences, interviews with reporters, op-ed pieces, letters to the editor and more; and to promoting sensible environmental solutions.
Wendy Wendlandt, President
Andre Delattre, Chief Operating Officer
- 10 Environmental Defense Fund (EDF)**
 1875 Connecticut Avenue NW 202-572-3298
 Suite 600 www.edf.org
 Washington, DC 20009
 Dedicated to protecting the environmental rights of all people, including future generations. Among these rights are clean air, clean water, healthy, nourishing food and a flourishing ecosystem. Works with organizations, businesses, government and communities to develop science and economics-based solutions to environmental problems.
Founded: 1967
Fred Krupp, President
Catherine Nardone, Chief Development Officer
- 11 Institute for Global Environmental Strategies**
 3033 Wilson Blvd info@strategies.org
 Suite 700 www.strategies.org
 Arlington, VA 22201
 IGES is an earth and space science educator.
Nancy Colleton, President
Rusty Low, Chief Scientist
- 12 Institute of Clean Air Companies (ICAC)**
 2200 Wilson Boulevard 202-478-6188
 Suite 310 www.icac.com
 Arlington, VA 22201
 Organization of manufacturers of air pollution monitoring and control systems.
Founded: 1960
Clare Schulzki, Executive Director
Jordan Flanagan, Director, Policy & Programs
- 13 International Center for Arid and Semiarid Land Studies**
 Texas Tech University
 International Affairs 806-742-3667
 601 Indiana Ave oia.reception@ttu.edu
 Lubbock, TX 79409-5004 www.depts.ttu.edu/international
 Interdisciplinary study of arid and semiarid environments from international perspective.
Founded: 1966
Joan Goodman-Williamson, Executive Director
- 14 International Research Institute for Climate and Society**
 61 Route 9W 845-680-4468
 Palisades, NY 10964-1000 info@iri.columbia.edu
 iri.columbia.edu

The International Research Institute for Climate and Society (IRI) aims to enhance society's capability to understand, anticipate and manage the impacts of climate in order to improve human welfare and the environment, especially in developing countries. This goal is conducted through strategic and applied research and education.

John Furlow, Director
Lisa Goddard, Senior Research Scientist

- 15 National Association of Clean Air Agencies**
1530 Wilson Blvd 571-970-6678
Suite 320 4cleanair@4cleanair.org
Arlington, VA 22209 www.4cleanair.org
National, non-partisan, non-profit association of air pollution control agencies.
Miles Keogh, Executive Director

National: Business & Education

- 16 ASTM International**
100 Barr Harbor Dr 610-832-9500
PO Box C700 877-909-2786
West Conshohocken, PA 19428-2959 Fax: 610-832-9555
service@astm.org
www.astm.org
One of the world's largest, and earliest, international standards developing organizations.
Founded: 1898 30K members
Katharine E. Morgan, President

- 17 American Association of Zoo Keepers**
8476 E Speedway Blvd 520-298-9688
Suite 204 www.aazk.org
Tucson, AZ 85710-1728
Membership association for animal care professionals, fostering professional development and advancing animal care, animal welfare and conservation.

- 18 American Chemical Society**
1155 16th St NW 614-447-3776
Washington, DC 20036 800-333-9511
service@acs.org
www.acs.org
The American Chemical Society aims to promote a positive public perception and understanding of chemistry and the chemical sciences through public outreach programs and public awareness campaigns; involve the Society's 150,000+ members in improving the public's perception of chemistry.
Founded: 1876
Thomas M. Connelly Jr., Executive Director & CEO

- 19 American Chemistry Council**
700 Second St NE 202-249-7000
Washington, DC 20002 www.americanchemistry.com
Industry organization working to enable a more sustainable future, through advocacy, member engagement, communications, and scientific research.
Founded: 1872
Chris Jahn, President & CEO
Raymond J. O'Bryan, CFO & CAO

- 20 American Federation of Teachers**
555 New Jersey Ave NW 202-879-4400
Washington, DC 20001 www.aft.org
Founded to represent the economic, social and professional interests of classroom teachers.
Founded: 1916 1.7 million members
Randi Weingarten, President
Fedrick C. Ingram, Secretary-Treasurer

- 21 American Forest & Paper Association**
1101 K Street NW 202-463-2700
Suite 700 info@afandpa.org
Washington, DC 20005 www.afandpa.org

The national trade association of the forest, paper, and wood products industry, seeking to advance public policies, and to promote a strong and sustainable forest products industry both in the US and internationally.

Founded: 1993
Heidi Brock, President & CEO
Elizabeth VanDersarl, Executive Director, Admin

- 22 American National Standards Institute**
1899 L Street NW 202-293-8020
11th Floor Fax: 202-293-9287
Washington, DC 20036 info@ansi.org
www.ansi.org

The Institute's mission is to enhance both the global competitiveness of US business and the US quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems, and safeguarding their integrity.

Founded: 1918 3.5 million members
Joe Bhatia, President & CEO
Anne Caldas, Sr. Dir., Standards

- 23 American Public Works Association**
1200 Main St 816-472-6100
Suite 1400 800-848-2792
Kansas City, MO 64105-2100 Fax: 816-472-1610
www.apwa.net

An international educational and professional association of public agencies, private sector companies, and individuals dedicated to providing high quality public works goods and services.

Founded: 1937 30,000 members
Scott Grayson, Executive Director
Matt Harper, Education Manager

- 24 Association for Educational Communications and Technology**
320 W 8th Street 812-335-7675
Suite 101 877-677-2328
Bloomington, IN 47404-3745 aect@aect.org
www.aect.org

Professional association of educators seeking to improve instruction through technology.

Phillip Harris, Executive Director
Danilo Baylen, Executive Secretary

- 25 Association of American Geographers**
1710 16th Street NW 202-234-1450
Washington, DC 20009-3198 Fax: 202-234-2744
membership@aag.org
www.aag.org

Nonprofit, educational society advancing the theory, methods and practice of geography.

Founded: 1904
Gary Langham, Executive Director
Michelle Ledoux, Director, Memberships

- 26 Association of Environmental and Resource Economists (AERE)**
222 S Westmonte Drive 407-774-7880
Suite 111 Fax: 407-774-6440
Washington, DC 32714 info@aere.org
www.aere.org

Offers a way to exchange ideas, stimulate research, and promote graduate training in resource and environmental economics. Members come from academic institutions, the public sector, and private industry.

Founded: 1979 Over 1,000 members
Karen L. Palmer, President
Margaret Walls, Treasurer

- 27 Association of State Wetland Managers (ASWM)**
32 Tandberg Trail 207-892-3399
Suite 2A Fax: 207-894-7992
Windham, ME 04062 laura@aswm.org
www.aswm.org

Nonprofit organization dedicated to the protection and restoration of the nation's wetlands. ASWM's goal is to help public and

private wetland decision-makers utilize the best possible scientific information and techniques in wetland delineation, assessment, mapping, planning, regulation, acquisition, restoration and other management.

Founded: 1983

Marla J. Stelk, Executive Director

Brenda Zollitsch, Senior Policy Analyst

28 Association of Zoos and Aquariums (AZA)

8403 Colesville Road 301-562-0777
Suite 710 Fax: 301-562-0888
Silver Spring, MD 20910-3314 membership@aza.org
www.aza.org

Nonprofit organization dedicated to the advancement of accredited zoos and aquariums in the areas of animal care, wildlife conservation, education and science.

Founded: 1924

Dan Ashe, President & CEO

Craig Hoover, Executive Vice President

29 Bank Information Center

1023 15th Street NW 202-737-7752
Washington, DC 20005 info@bankinformationcenter.org
www.bankinformationcenter.org

The Bank Information Center partners with civil society to help countries influence the World Bank and other international financial institutions to promote social and economic justice and ecological sustainability.

Elana Berger, Executive Director

Ladd Connell, Director, Environment

30 Biotechnology Industry Organization (BIO)

1201 Maryland Avenue NW 202-962-9200
Suite 900 Fax: 202-488-6301
Washington, DC 20024 info@bio.org
www.bio.org

The mission of BIO is to be the champion of biotechnology and the advocate for its member organizations-both large and small.

Founded: 1993

Michelle McMurry-Heath, President & CEO

Cartier Esham, Chief Science Officer

31 Bureau of Land Management (BLM)

U.S. Department of the Interior
1849 C Street NW 303-236-6312
Washington, DC 20240 www.blm.gov

The mission of the Bureau of Land Management is to ensure the sustainability and diversity of the public lands for the use and enjoyment of present and future generations. The Bureau offers environmental education, news about the activities of the Bureau, events, and regulations.

Founded: 1946

Michael Nedd, Deputy Director, Operations

Nada Wolff Culver, Deputy Director, Policy

32 Business for Social Responsibility (BSR)

5 Union Square W 212-370-7707
6th Floor www.bsr.org
New York, NY 10003

Works with its global network of more than 250 member companies to develop sustainable business strategies and solutions through consulting, research and cross-sector collaboration.

Founded: 1992

Aron Cramer, President & CEO

Laura Gitman, Chief Operating Officer

33 Center for the Study of Carbon Dioxide and Global Change

center@co2science.org
www.co2science.org

Also known as CO2 Science, the Center reviews articles, books and other educational materials, attempting to separate reality from rhetoric in the debate that surrounding the subject of carbon dioxide and global change. The Center maintains on-line

instructions on how to conduct CO2 enrichment and depletion experiments in its Global Change Laboratory.

Craig D. Idso, Chair & Founder

Frederick D. Palmer, Senior Fellow

34 Ceres

99 Chauncy Street 617-247-0700
6th Floor info@ceres.org
Boston, MA 02111 www.ceres.org

Ceres is a sustainability non-profit organization working with investors and companies to build leadership and drive solutions throughout the economy. Through networks and advocacy, Ceres tackles international sustainability challenges, including climate change, water scarcity and pollution, and inequitable workplaces.

Founded: 1989

Mindy S. Lubber, President & CEO

Dawn M. Martin, Chief Program Officer

35 Chlorine Institute

1300 Wilson Boulevard 703-894-4140
Suite 525 info@cl2.com
Arlington, VA 22209 www.chlorineinstitute.org

Exists to support the chlor-alkali industry and serve the public by fostering continuous improvements to safety and the protection of human health and the environment connected with the production, distribution and use of chlorine, sodium and potassium hydroxides, and sodium hypochlorite; and the distribution and use of hydrogen chloride.

Founded: 1924 196 Members

Frank Reiner, President

Robyn Kinsley, VP, Transportation

36 Corps Network

1275 K Street NW 202-737-6272
Suite 1050 Fax: 202-737-6277
Washington, DC 20005 msprenk@corpsnetwork.org
corpsnetwork.org

A proud advocate and representative of the nation's Service and Conservation Corps. The number one goal is to sustain and grow the Corps movement. The Corps Network's member Service and Conservation Corps operate in 42 state and the District of Columbia. Over 26,000 Corps members, ages 16-25, contribute and generate more than 16 million hours of service annually.

Founded: 1985

Mary Ellen Sprinkel, President & CEO

Marie Walker, Chief Operating Officer

37 Council of Producers and Distributors of Agrotechnology

4201 Wilson Blvd 202-386-7407
Suite 700 info@cpda.com
Arlington, VA 22203 cpda.com

Serves as an advocate for suppliers of agricultural adjuvant and inert ingredients, including sell tank-mix adjuvants, pesticides, & other agrotechnology products.

Founded: 1987

Gary Halvorson, President

38 Council of State Governments (CSG)

1776 Avenue of the States 859-244-8000
Lexington, KY 40511 membership@cs.org
www.cs.org

A region-based forum that fosters the exchange of insights and ideas to help state officials shape public policy. CSG serves the executive, judicial and legislative branches of state government through leadership education, research and information services.

Founded: 1933

David Akins, Executive Director/CEO

Gov. Laura Kelly, National President

39 Earth First!

PO Box 411892 561-320-3840
Kansas City, MO 64141 collective@earthfirstjournal.news
earthfirstjournal.news

Earth First! was first created in response to a compromising and increasingly corporate environmental community. Earth First! publish Earth First! Journal. Earth First! Journal highlights radical environmental movements and causes. Earth First! pride themselves on being a grassroots organization fighting to save lives and the environment.

Founded: 1979

40 EarthShare

7735 Old Georgetown Road
Suite 510
Bethesda, MD 20814

800-875-3863
Fax: 240-333-0301
info@earthshare.org
www.earthshare.org

A nationwide network of America's leading non-profit environmental and conservation organizations; works to promote environmental education and charitable giving through workplace giving campaigns.

Founded: 1988

*Brad Leibov, Chief Executive Officer
Jon Cocina, VP, Impact*

41 Ecological Society of America

1990 M Street NW
Suite 700
Washington, DC 20036

202-833-8773
Fax: 202-833-8775
esahq@esa.org
www.esa.org

To promote ecological science by improving communication among ecologists; raise the public's level of awareness of the importance of ecological science; increase the resources available for the conduct of ecological science.

Founded: 1915 Over 9,000 members

*Catherine O'Riordan, Executive Director
Elizabeth Biggs, Chief Financial Officer*

42 Environmental Council of the States

1250 H Street NW
Suite 850
Washington, DC 20005

202-266-4920
Fax: 202-266-4937
ecos@ecos.org
www.ecos.org

National non-profit and non-partisan association of state and territorial environmental agency leaders. Its purpose is to improve human health and the environment through improving the capabilities of regional environmental agencies.

Founded: 1993

*Don Welsh, Executive Director
Carolyn Hanson, Deputy Director*

43 Environmental Media Association (EMA)

10153 Riverside Drive
Suite 340
Toluca Lake, CA 91602

323-556-2790
ema@ema-online.org
www.green4ema.org

Dedicated to the broadcast of balanced news about the environment. Through celebrity role modeling, campaign work, year-round programs and annual events EMA looks to promote environmental progress and innovation.

Founded: 1989

*Debbie Levin, Chief Executive Officer
Aicha Bangoura, Manager, Programs & Events*

44 Federal Wildlife Officers Association

info@fwoa.net
www.fwoa.net

The Federal Wildlife Officers Association (FWOA) is a non-profit organization made up of over 250 dedicated wildlife agents and retired agents who work together to benefit the wildlife resources and people.

Founded: 1986

45 Federation of Environmental Technologists (FET)

W175 N11081 Stonewood Drive
Suite 203
Germantown, WI 53022

262-437-1700
Fax: 262-437-1702
info@fetinc.org
www.fetinc.org

A nonprofit organization formed to assist industry in interpretation of and compliance with environmental regulations. FET provides education on regulatory compliance and technological

advancements to its members, and other environmental professionals, through training, professional development, and networking.

Founded: 1982 600-700 Members

*Jeffrey Nettesheim, Chair/Director
Jason Martin, President/Director*

46 Forestry Conservation Communications Association (FCAA)

424 E. Middle Street
Rear Unit
Gettysburg, PA 17325

717-398-0812
844-458-0298
Fax: 717-778-4237
info@fccca-usa.org
fccca-usa.org

National organization serving all public safety two-way radio licensees by locating suitable frequencies within designated areas, coordinating licensing with the FCC, and protecting them once approved.

*Ralph Haller, Executive Director
Michelle Fink, Natl. Frequency Coordinator*

47 Get America Working!

1700 N Moore Street
Suite 200
Arlington, VA 22209-1921

skent@getamericaworking.org
www.getamericaworking.org

A nonprofit national organization striving to create millions of jobs through structural changes in the US economy.

Steve Kent, Contact

48 Global Council for Science and the Environment

1776 Eye Street NW
Suite 750
Washington, DC 20006

GCSE@GCSEglobal.org
www.gcseglobal.org

A nongovernmental organization working to improve the scientific basis for making decisions on environmental issues. The Council promotes a new crosscutting approach to environmental science that integrates interdisciplinary research, scientific assessment, environmental education and communication of science-based information to decision makers and the public.

Founded: 1990

*Michelle Wyman, Executive Director
Erica Goldman, PhD, Deputy Director*

49 Global Environmental Management Initiative (GEMI)

1200 G Street NW
Suite 350
Washington, DC 20005

202-296-7449
www.gemi.org

Organization of companies dedicated to environment health and safety and sustainability, through the sharing of information and resources.

Founded: 1990

*Steve Hellem, Executive Director
Kellen Mahoney, Program Manager*

50 Green America

1612 K Street NW
Suite 600
Washington, DC 20006

800-584-7336
Fax: 202-331-8166
info@greenamerica.org
www.greenamerica.org

Formerly known as Co-op America, Green America seeks to foster social justice and environmental sustainability through harnessing economic power.

Founded: 1982

Alisa Gravitz, President & CEO

51 Green Seal

1001 Connecticut Avenue NW
Suite 827
Washington, DC 20036-5525

202-872-6400
Fax: 202-872-4324
www.greenseal.org

An independent nonprofit organization dedicated to safeguarding the environment and transforming the marketplace by pro-

moting the manufacture, purchase, and use of environmentally responsible products and services.

Founded: 1989

Doug Gatlin, Chief Executive Officer
Deon Glaser, Director, Education

- 52 Greenpeace USA**
702 H Street NW
Suite 300
Washington, DC 20001
- 202-884-7615
800-722-6995
connect@greenpeace.us
www.greenpeace.org

Greenpeace is an independent, international organization dedicated to using peaceful protest and communication to draw attention to environmental issues, and to promote solutions.

Founded: 1971

Annie Leonard, Executive Director
Lindsey Allen, Chief Programs Officer

- 53 H. John Heinz III Center for Science, Economics and the Environment**
900 17th Street NW
Suite 700
Washington, DC 20006
- 202-737-6307
info@heinzctr.org
www.heinzctr.org

The Center is a nonpartisan, nonprofit institute dedicated to improving the scientific and economic foundation for environmental policy through multisectoral collaboration. The Heinz Center fosters collaboration among industry, environmental organizations, academia, and all levels of government in each of its program areas.

Founded: 1995

Conn Nugent, President
Matthew Grason, Fundraising Coordinator

- 54 Halogenated Solvents Industry Alliance, Inc. (HSIA)**
3033 Wilson Boulevard
Suite 700
Arlington, VA 22201
- 703-875-0683
info@hsia.org
www.hsia.org

The mission is to represent the users and producers of chlorinated solvents - trichloroethylene, perchloroethylene and methylene chloride. To promote the continued safe use of these products and the use of sound science in assessing their potential health effects.

Founded: 1980

Faye Graul, Executive Director
Christopher Bevan, PhD, DABT, Dir., Scientific Programs

- 55 Honor the Earth**
607 Main Avenue
PO Box 63
Callaway, MN 56521
- 218-375-3200
info@honorearth.org
www.honorearth.org

Honor the Earth is a Native-led organization, addressing the two primary needs of the Native environmental movement: the need to break the geographic and political isolation of Native communities and the need to increase financial resources for organizing and change.

Founded: 1993

Winona LaDuke, Executive Director
Pamela Mahling, Administrative Director

- 56 Household and Consumer Products Association**
1667 K Street NW
Washington, DC 20006
- 202-872-8110
info@theHCPA.org
www.thehcpa.org

Formerly known as the Consumer Specialty Products Association (CSPA), the HCPA is a trade association representing companies that sell products intended for cleaning, protecting, maintaining, and disinfecting dwellings and commercial environments.

Founded: 1914 220 members

Stephen J. Caldeira, President & CEO
Morgan Mitchell, Coordinator, Member Services

- 57 Institute for Earth Education (IEE)**
PO Box 115
Greenville, WV 24945
- 304-832-6404
Fax: 304-832-6077
info@ieetree.org
www.ieetree.org/iee

The IEE develops and disseminates instructional programs aimed at helping people live more lightly, harmoniously, and joyously with the natural world, through three pillars: interpretation, education, and contemplation.

Founded: 1974

- 58 Institute of Clean Air Companies (ICAC)**
2200 Wilson Boulevard
Suite 310
Arlington, VA 22201
- 202-478-6188
www.icac.com

Organization of manufacturers of air pollution monitoring and control systems.

Founded: 1960

Clare Schulzki, Executive Director
Jordan Flanagan, Director, Policy & Programs

- 59 Institute of Environmental Sciences and Technology (IEST)**
1827 Walden Office Square
Suite 400
Schaumburg, IL 60173
- 847-981-0100
Fax: 847-981-4130
information@iest.org
www.iest.org

An international professional society that serves the environmental sciences in the areas of contamination control in electronics manufacturing and pharmaceutical processes, design, test and evaluation of commercial and military equipment and product reliability issues.

Founded: 1953

Angela McKay, Executive Director
Heather Wooden, Coordinator, Education

- 60 Institute of Hazardous Materials Management (IHMM)**
9210 Corporate Blvd.
Suite 470
Rockville, MD 20850
- 301-984-8969
info@ihmm.org
www.ihmm.org

A nonprofit organization that protects the environment and the public's health and safety through the administration of credentials recognizing professionals who have demonstrated a high level of knowledge, expertise, and excellence in the management of hazardous materials.

Founded: 1984

Gene Guilford, Executive Director
Patricia Buley, Director, Certification

- 61 Interstate Mining Compact Commission (IMCC)**
437 Carlisle Drive
Suite A
Herndon, VA 20170
- 703-709-8654
Fax: 703-709-8655
imcc.isa.us

A multi-state governmental organization that represents the natural resource interests of its members. They work closely with several Federal agencies such as Office of Surface Mining Reclamation and Enforcement, US EPA and US Bureau of Land Management.

Founded: 1971

Tom Clarke, Executive Director

- 62 Jane Goodall Institute**
1120 20th Street NW
Suite 520
Washington, DC 20036
- 703-682-9220
Fax: 703-682-9312
www.janegoodall.org

A nonprofit corporation founded to concentrate on research, education and conservation of wildlife, pursuant to the life work of Jane Goodall. Offices are located across the world.

Jane Goodall, Ph.D., DBE, Founder
Anna Rathmann, Executive Director

- 63 Land Improvement Contractors of America (LICA)**
3080 Ogden Avenue
Suite 300
Lisle, IL 60532
- 630-548-1984
www.licanational.com

Organization composed primarily of small contractors whose activities related to the conservation, use and improvement of land and water resources ranging from grading, excavating, paving, landscaping, wetland development, drainage, and site preparation. Strives to improve the climate within which members con-

duct their businesses by working for better legislation and regulations.

Founded: 1950
Gerald Biuso, Sr., Chief Executive Officer
Nick Yaksich, Director, Govt. Relations

64 National Association for Environmental Management (NAEM)

1612 K Street NW 202-986-6616
 Suite 1002 800-391-6236
 Washington, DC 20006 programs@naem.org
 www.naem.org

Provides peer-to-peer networking for EHS managers; develop EHS professionals as leaders; advance the integration of EHS into business as a value driver; and promote the growth and implementation of EHS management systems worldwide; so, as to offer tangible benefits to the regulated entity and other stakeholders.

Founded: 1990
Carol Singer Neuvelt, Executive Director
Virginia Hoekenga, Deputy Director

65 National Association of Biology Teachers (NABT)

PO Box 3363 703-264-9696
 Warrenton, VA 20188 888-501-6228
 Fax: 202-962-3939
 office@nabt.org
 www.nabt.org

Includes more than 3,000 educators who share experience and expertise with colleagues from around the globe; keep up with trends and developments; and grow professionally. The NABT empowers educators to provide the best biology and life science education for all students.

Founded: 1938
Julie Angle, President
Jaelyn Reeves-Pepin, Executive Director

66 National Association of Environmental Professionals (NAEP)

2150 N 107th Street 206-209-5286
 Suite 205 office@naep.org
 Seattle, WA 98133 www.naep.org

NAEP is a multidisciplinary association dedicated to the advancement of environmental professionals in the US and abroad, and a forum for current information on environmental planning, research, and management.

Tiffany Hanzo, Executive Director
Makenna Wallingford, Communications Coordinator

67 National Conference of State Legislatures (NCSL)

7700 East First Place 303-364-7700
 Denver, CO 80230 800-659-2656
 Fax: 303-364-7800
 ncslnet-admin@ncsl.org
 www.ncsl.org

The National Conference of State Legislatures serves the legislators and staffs of the nation's 50 states and its commonwealths and territories. NCSL is a bipartisan organization with three objectives: to improve the quality and effectiveness of state legislatures; to foster interstate communications and cooperation; and to ensure states a strong cohesive voice in the federal system.

Founded: 1975
Robin Vos, President
Martha Wigton, Staff Chair

68 National Energy Foundation (NEF)

4516 S 700 E 801-327-9500
 Suite 100 800-616-8326
 Salt Lake City, UT 84107 Fax: 801-908-5400
 nefl.org

A non-profit educational organization dedicated to the development, dissemination and implementation of supplemental educational materials and programs primarily related to the

environment, conservation, science, energy, water and natural resources.

Founded: 1976
Elissa Richards, President & CEO
Anne Lowe, Vice-President, Operations

69 National Environmental Education Foundation (NEEF)

4301 Connecticut Avenue NW 202-833-2933
 Suite 160 www.neefusa.org
 Washington, DC 20008-2326

Provides objective environmental information and education to help Americans live better. Environmental education programs include those tailored to the adult public, for health professionals, and in the schools.

Meri-Margaret Deoudes, President & CEO
Sara Espinoza, Vice President, Programs

70 National FFA Organization

6060 FFA Drive 888-332-2668
 PO Box 68960 Fax: 800-366-6556
 Indianapolis, IN 46268-0960 www.ffa.org

The organization (formerly Future Farmers of America) is dedicated to the personal and professional development of young people through agricultural education.

Founded: 1928
Dave Schapker, Chief Financial Officer
Christine White, Chief Program Officer

71 National Geographic Society

1145 17th Street NW 800-373-1717
 Washington, DC 20036 givinginfo@ngs.org
 www.nationalgeographic.org

Seeks to inspire people to care about the planet. Programs support scientific fieldwork and expeditions; encourage geography education for students; and promote natural and cultural conservation.

Founded: 1888
Jill Tiefenthaler, Chief Executive Officer
Valerie Craig, Chief Science Officer

72 National Governors Association (NGA)

444 North Capitol Street 202-624-5300
 Suite 267 Fax: 202-624-5313
 Washington, DC 20001 info@nga.org
 www.nga.org

The Association works closely with the administration and Congress on state and federal policy issues, serves as a vehicle for sharing knowledge of innovative programs among states, and provides technical assistance and consultant services to governors on a wide range of management and policy issues. Part of the organization is the Center for Best Practices which undertakes demonstration projects and provides anticipatory research on important policy issues.

Founded: 1908
Bill McBride, Executive Director
LeAnne Wilson, Chief Operating Officer

73 National Network of Forest Practitioners (NNFP)

8 North Court Street 740-593-8733
 Suite 411
 Athens, OH 45701

Promotes the mutual well-being of workers, rural communities and forests by supporting individuals and groups that build sustainable relationships between forests and people.

74 National Parent Teachers Association

1250 N. Pitt Street 703-518-1200
 Alexandria, VA 22314 800-307-4782
 Fax: 703-836-0942
 info@pta.org
 www.pta.org

The mission of the National PTA is to support and speak on behalf of children and youth in schools, in the community and before governmental bodies and other organizations; to assist parents in developing the skills they need to raise and protect their children

and to encourage parent and public involvement in the public schools.

*Nathan R. Monell, Executive Director
Kristen Johnson, Director, Education*

- 75 National Religious Partnership for the Environment**
110 Maryland Avenue, NE Suite 203 Washington, DC 20002
nrpe@nrpe.org
www.nrpe.org
The mission of the National Religious Partnership for the Environment is to permanently integrate issues of environmental sustainability and justice across all aspects of organized religious life.
*Cassandra Carmichael, Executive Director
Rev. Michael McClain, Outreach Coordinator*
- 76 National Waste & Recycling Association (NWRA)**
1550 Crystal Drive Suite 804 Arlington, VA 22202
202-244-4700
800-424-2869
Fax: 202-966-4824
membership@wasterecycling.org
www.wasterecycling.org
Formerly known as the Environmental Industry Association, which oversaw the National Solid Wastes Management Association and the Waste and Equipment Technology Association. This trade association represents private-sector companies in North America that provide solid, hazardous and medical waste collection, recycling and disposal services, and companies that provide professional and consulting services to the waste services industry.
*Founded: 1962
Darrell K. Smith, President & CEO
Anne Germain, Chief Operating Officer*
- 77 Nature's Classroom**
19 Harrington Road Charlton, MA 01507
508-248-2741
800-433-8375
info@naturesclassroom.org
naturesclassroom.org
Nature's Classroom is a residential environmental education program, at 12 sites in New York and New England. They give students, and teachers, the chance to experience education from another perspective, outside the walls of the classroom. After spending time in Nature's Classroom, living and learning together, students develop a sense of community, a confidence in themselves and an appreciation for others that carries over to the school community.
Dr. John G. Santos, Director
- 78 Netcentric Campaigns**
5335 Wisconsin Ave NW Suite 440 Washington, DC 20015
www.netcentriccampaigns.org
Netcentric Campaigns transforms advocacy for foundations and non-profits by building networks of people to move change forward.
*Founded: 2000
Marty Kearns, Executive Director
Krishna Roy, Senior Strategy Advisor*
- 79 Noise Free America**
P.O. Box 2754 Chapel Hill, NC 27515
877-664-7366
director@noisefree.org
www.noisefree.org
A national non-profit organization aimed at reducing noise pollution in the community. Their main focus is on noises from airplanes and helicopters, road vehicles, lawn and garden equipment, music, sports stadiums, and other sources.
*Founded: 2001
Ted Rueter, Director*
- 80 North American Association for Environmental Education (NAAEE)**
1725 DeSales Street NW Suite 401 Washington, DC 20036
202-419-0412
info@naaee.org
www.naaee.org

A professional association that promotes excellence in environmental education and serves environmental educators for the purpose of achieving environmental literacy to allow present and future generations to benefit from a safe and healthy environment.

*Founded: 1971 16,000 members
Judy Braus, Executive Director
Sarah Bodor, Director, Policy*

- 81 Orion Society**
187 Main Street Great Barrington, MA 01230
413-528-4422
orionmagazine.org
A nonprofit organization supported by donations from individuals, families and foundations, and corporate and government grants. Mission is to inform, inspire, and engage individuals and grassroots organizations in becoming a significant cultural force for healing nature and community. Publishes Orion Magazine, among other publications.
*Founded: 1992
Amy Brady, Executive Director*
- 82 Pew Charitable Trusts**
2005 Market Street Suite 2800 Philadelphia, PA 19103-7077
215-575-9050
info@pewtrusts.org
www.pewtrusts.org
Pew uses an analytical approach to solve international challenges, by improving public policy, informing the public, and bettering civic life.
*Susan K. Urahn, President & CEO
Linda Bartlett, SVP & CFO*
- 83 Public Citizen**
1600 20th Street NW Washington, DC 20009
202-588-1000
member@citizen.org
www.citizen.org
A consumer advocacy organization founded to represent consumer interests in Congress, the executive branch, and the courts.
*Founded: 1971
Robert Weissman, President
Lisa Gilbert, Executive Vice President*
- 84 Public Employees for Environmental Responsibility (PEER)**
962 Wayne Avenue Suite 610 Silver Spring, MD 20910
202-265-7337
Fax: 202-265-4192
info@peer.org
www.peer.org
A national nonprofit alliance of local, state and federal scientists, law enforcement officers, land managers and other professionals dedicated to upholding environmental laws and values.
*Tim Whitehouse, Executive Director
Kyla Bennett, Director, Science Policy*
- 85 Renew The Earth (RTE)**
8 Robin Ann Lane Westerlo, NY 12193
518-797-3377
susancaumont@renew-the-earth.org
www.renew-the-earth.org
Promotes an exchange of ideas, information, and action across the globe in an effort to move away from fossil fuels, and embrace sustainable energy and water.
*Founded: 1989
Susan Caumont, President
Dennis Irwin, Secretary*
- 86 Renewable Fuels Association (RFA)**
16024 Manchester Road Suite 101 Ellisville, MO 63011
636-594-2284
info@ethanolrfa.org
www.ethanolrfa.org
The national trade association for the US ethanol industry. Promotes policies, regulations and research and development initiatives that will lead to the increased production and use of fuel ethanol.
*Founded: 1981
Geoff Cooper, President & CEO
Troy Bredenkaamp, Senior VP, Public Affairs*

87 Roger Tory Peterson Institute of Natural History
311 Curtis Street
Jamestown, NY 14701
716-665-2473
info@rtpi.org
rtpi.org

Nature education organization that works on the national level, with an audience of primarily adults who are interested in gaining skills for educating young people about the natural world. RTPI also houses the life's work of Roger Tory Peterson.

Founded: 1984
Arthur Pearson, Chief Executive Officer
Twan Leenders, Senior Director, Science

88 Silicones Environmental, Health and Safety Center
American Chemistry Council (ACC)
700 2nd Street NE
Washington, DC 20002
202-249-7000
www.americanchemistry.com

An organization of North America silicone chemical producers and importers. It promotes the safe use of silicones through product stewardship and environmental, health and safety research. It focuses on coordinating research and submitting it for peer review through independent advisory boards and publication of peer-reviewed literature.

Chris Jahn, President & CEO

89 Smithsonian Institution
Smithsonian Information
SI building, Room 153, MRC 010
PO Box 37012
Washington, DC 20013-7012
202-633-1000
info@si.edu
www.si.edu

Independent trust instrumental of the United States holding more than 154 million artifacts and specimens in its trust for the public interest and knowledge. Also a center for research dedicated to public education, national service, and scholarship in the arts, sciences, and history.

Founded: 1846
Lonnie G. Bunch III, Secretary
Meroe Park, Deputy Secretary & COO

90 Society of American Foresters (SAF)
2121 K Street NW
Suite 315
Washington, DC 20037
301-897-8720
866-897-8720
Fax: 301-897-3690
membership@safnet.org
www.eforester.org

To advance the science, education, technology, and practice of forestry; to enhance the competency of its members; to establish professional excellence; and to use the knowledge, skills, and conservation ethic of the profession to ensure the continued health and use of forest ecosystems.

Founded: 1900
Terry Baker, Chief Executive Officer
Danielle Watson, Director, Policy Affairs

91 Society of Chemical Manufacturers and Affiliates (SOCMA)
1400 Crystal Drive
Suite 630
Arlington, VA 22202
571-348-5100
Fax: 571-348-5138
info@socma.org
www.socma.org

International trade association serving small and mid-sized batch chemical manufacturers, striving for safe, sustainable and environmentally sound operations.

Founded: 1921
Jennifer L. Abril, President & CEO
Paul J. Hirsh, Sr. VP, Industry Development

92 Student Pugwash USA
700 12th Street NW
Suite 700-93149
Washington, DC 20005
202-794-6928
contact@studentpugwash.org
www.spusa.org

Promotes social responsibility in science and technology. Prepare science, technology and policy students to make social responsibility a guiding focus of their academic and professional endeavors.

Founded: 1979
Jeff Porten, Chair

93 Turtle Conservancy
PO Box 1289
Ojai, CA 93024
212-353-5060
Fax: 212-353-5014
info@turtleconservancy.org
www.turtleconservancy.org

Dedicated to the study and conservation of turtles and tortoises worldwide. One of the world's leading institutions on the research and conversation of turtles.

Eric Goode, President & CEO

94 U.S. Global Change Research Program
1800 G St NW
Suite 9100
Washington, DC 20006
202-223-6262
Fax: 202-223-3065
www.globalchange.gov

The U.S. Global Change Research Program (USGCRP) was established by Congress to organize federal research into studying forces that affect global environment, be they human or natural.

Founded: 1989
Michael Kuperberg, Executive Director
Nico Adams, Chief of Operations

95 United Nations Environment Programme New York Office
2 UN Plaza, Room DC2-803
323 E 44th Street
New York, NY 10017
212-963-8210
Fax: 212-963-7341
unepnyo@un.org
www.unep.org

Advocates for the global environment and promotes sustainable development within the United Nations.

Founded: 1972
Ligia Noronha, Director

96 Welder Wildlife Foundation
PO Box 1400
Sinton, TX 78387
361-364-2643
Fax: 361-364-2650
welderwildlife.org

A private nonprofit organization that conducts research and education in the fields of wildlife management and conservation, and other closely related fields.

Founded: 1954
Terry Blankenship, Director
Selma Glasscock, Assistant Director

National: Design & Architecture

97 ABS Group
American Bureau of Shipping
1701 City Plaza Drive
Spring, TX 77389
281-673-2800
Fax: 281-877-5946
info@abs-group.com
www.abs-group.com

A subsidiary of American Bureau of Shipping offering risk management, safety, quality and environmental consulting and certification services to a wide range of industries and companies throughout the world.

Founded: 1990
Ryan Moody, President & CEO
Tricia Bell, Director, Communications

98 American Society of Landscape Architects (ASLA)
636 Eye Street NW
Washington, DC 20001-3736
202-898-2444
888-999-2752
Fax: 202-898-1185
info@asla.org
www.asla.org

To advance the field of landscape architecture through advocacy, communication, education, and fellowship.

Founded: 1899
Torey Carter-Conneed, Chief Executive Officer

99 Associated General Contractors of America (AGC)
 2300 Wilson Boulevard 703-548-3118
 Suite 300 800-242-1767
 Arlington, VA 22201 Fax: 240-396-2470
 info@agc.org
 www.agc.org

Advocates for and on behalf of the construction industry. Priorities include health and safety, and energy and the environment, with dedicated environmental resources available to members.
 26,000 member firms
Stephen Sandherr, Chief Executive Officer
Christine Souders, Chief Financial Officer

100 Environmental Design Research Association (EDRA)
 2010 Pear Street 507-339-4620
 Suite 1060 headquarters@edra.org
 Pinole, CA 94564 www.edra.org

Advances and disseminates behavior and design research toward improving understanding of the relationships between people and their environments.
 Founded: 1968
Deni Ruggeri, Executive Director
Sharmin Kader, Chair

101 Green Building Initiative (GBI)
 7805 SW 40th Avenue 503-274-0448
 Suite 80010 info@thegbi.org
 Portland, OR 97219 thegbi.org

Nonprofit organization dedicated to accelerating the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings.
 Founded: 2004
Vicki Worden, President & CEO
Megan Baker, Director, Engagement

102 Land Improvement Contractors of America (LICA)
 3080 Ogden Avenue 630-548-1984
 Suite 300 www.licanational.com
 Lisle, IL 60532

Organization composed primarily of small contractors whose activities related to the conservation, use and improvement of land and water resources ranging from grading, excavating, paving, landscaping, wetland development, drainage, and site preparation. Strives to improve the climate within which members conduct their businesses by working for better legislation and regulations.
 Founded: 1950
Gerald Biuso, Sr., Chief Executive Officer
Nick Yaksich, Director, Govt. Relations

103 Rocky Mountain Institute
 Innovation Center
 22830 Two Rivers Road 970-927-3851
 Basalt, CO 81621 Fax: 970-927-3420
 www.rmi.org

An independent, entrepreneurial, nonprofit think and do tank. Envisage a world thriving, verdant, and secure, for all.
Jules Kortenhorst, Chief Executive Officer
John Schroeder, Chief Scientist

104 U.S. Green Building Council (USGBC)
 2101 L Street NW 202-742-3792
 Suite 500 800-795-1747
 Washington, DC 20037 info@usgbc.org
 usgbc.org

USGBC is a nonprofit organization that promotes sustainability in buildings design, construction, and operation. They work in collaboration with industry experts, market research publications and LEED professional credentials.
 Founded: 1993
Mahesh Ramanujam, President & CEO
David Witek, Chief Operating Officer

National: Disaster Preparedness & Response

105 Cultural Survival
 2067 Massachusetts Avenue 617-441-5400
 Cambridge, MA 02140 www.culturalsurvival.org

Provides a worldwide connection for a better global environment through effective letter-writing campaigns. Empowers people of all ages, cultures, and nationalities to protect the environment by creating partnerships for effective citizen action.
 Founded: 1972
Galina Angarova, Executive Director
Mark Camp, Deputy Executive Director

106 Disaster Recovery Institute International (DRI)
 1115 Broadway 866-542-3744
 12th Floor drii.org
 New York, NY 10010

DRI International is the non-profit that helps organizations prepare for and recover from disasters. DRI also serves continuity professionals through conferencing, outreach, and volunteerism.
 Founded: 1988
Chloe Demrovsky, President
Traci O'Neal, Sr. Director, Operations

107 International Association for Disaster Preparedness and Response (DERA)
 info@disasters.org
 www.disasters.org

Nonprofit association aiming to connect individuals and organizations involved in all aspects of emergency management.
 Founded: 1962
Howard Pierpont, President & CEO
Bascombe J. Wilson, EVP, International Programs

108 International Association of Emergency Managers (IAEM)
 201 Park Washington Court 703-538-1795
 Falls Church, VA 22046-4527 Fax: 703-241-5603
 info@iaem.com
 iaem.com

Nonprofit educational organization dedicated to Emergency Management and representing those professionals whose goals are saving lives and protecting property and the environment during emergencies and disasters.
Elizabeth B. Armstrong, Chief Executive Officer

109 International Association of Wildland Fire
 1418 Washburn Street 406-625-7059
 Missoula, MT 59801 888-440-4293
 execdir@iawfonline.org
 www.iawfonline.org

A professional association representing members of the global wildland fire community. It facilitates communication and provides leadership for the wildland fire community.
Toddi A. Steelman, President
Steven R. Miller, Vice-President

110 National Association of Flood and Stormwater Management Agencies (NAFSMA)
 PO Box 56764 202-289-8625
 Washington, DC 20040 Fax: 202-530-3389
 info@nafsma.org
 www.nafsma.org

NAFSMA is an organization of public agencies whose function is the protection of lives, property and economic activity from the adverse impacts of storm and flood waters. The mission of the association is to advocate public policy, encourage technologies and conduct education programs which facilitate and enhance the achievement of the public service functions of its members.
 Founded: 1978
Mark Pestrella, President
Steve Parrish, Vice President

111 National Council on Radiation Protection and Measurements (NCRP)

7910 Woodmont Avenue
Suite 400
Bethesda, MD 20814-3095
301-657-2652
Fax: 301-907-8768
ncrp@ncrponline.org
ncrponline.org

The Council seeks to formulate and widely disseminate information, guidance and recommendations on radiation protection and measurements which represent the consensus of leading scientific thinking.

Founded: 1964

Laura J. Atwell, Director, Operations
John D. Boice, Jr., Director, Science

112 National Emergency Management Association (NEMA)

1776 Avenue of the States
Lexington, KY 40511
www.nemaweb.org

Nonprofit, nonpartisan association seeking to improve the country's ability to handle all types of emergencies, disasters, and national security threats.

Founded: 1974

Sima Merick, President
Erica Bornemann, Vice President

113 National Fire Protection Association (NFPA)

1 Batterymarch Park
Quincy, MA 02169-7471
617-770-3000
800-344-3555
Fax: 800-593-6372
www.nfpa.org

Reduces the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training and education.

Founded: 1896 50,000 members

Jim Pauley, President
Christian Dubay, VP, Codes & Standards

114 Natural Hazards Center

University of Colorado Boulder
483 UCB
Boulder, CO 80309-0483
303-735-5844
hazctr@colorado.edu
hazards.colorado.edu

Advances and communicates knowledge on hazards mitigation and disaster preparedness, response, and recovery. Using an all-hazards and interdisciplinary framework, the Center fosters information sharing and integration of activities among researchers, practitioners, and policy makers from around the world; supports and conducts research; and provides educational opportunities for the next generation of hazards scholars and professionals.

Founded: 1976

Lori Peek, Director
Jason Van Horn, Program Manager

115 Safety Equipment Institute (SEI)

1307 Dolley Madison Boulevard
Suite 3A
McLean, VA 22101
703-442-5732
Fax: 703-442-5756
Info@SEInet.org
www.seinet.org

A private, nonprofit organization established to administer the first non-governmental, third-party certification program to test and certify a broad range of safety equipment products.

Founded: 1981

Tim Brooke, President
Anna Seiple, Program Director

National: Energy & Transportation

116 Alliance to Save Energy

1850 M St NW
Suite 610
Washington, DC 20036
202-857-0666
www.ase.org

This organization is a nonprofit collective of business, government, environmental and consumer leaders with the mission of

promoting energy efficiency worldwide to achieve a healthier economy, environment and greater energy security.

Founded: 1977

Paula R. Glover, President
Doug Abbott, Program Manager, Education

117 American Clean Skies Foundation

202-361-3701
info@cleanskies.org
www.cleanskies.org

Independent non-profit works for cleaner energy in the transportation and electric power sectors. In 2019, the Foundation temporarily suspended further activities pending new funding.

Founded: 2007

118 American Coal Ash Association (ACAA)

1616 17th Street
Suite 266
Denver, CO 80202
720-870-7897
info@acaa-usa.org
www.acaa-usa.org

Mission is to advance the management and use of coal combustion products in ways that are environmentally responsible, technically sound, commercially competitive and more supportive of a sustainable global community.

Thomas H. Adams, Executive Director
Alyssa Barto, Member Liaison

119 American Council for an Energy-Efficient Economy (ACEEE)

529 14th Street NW
Suite 600
Washington, DC 20045
202-507-4000
aceee.org

A nonprofit organization dedicated to advancing energy efficiency by promoting policies, programs, technologies and sustainable living. ACEEE employs a number of strategies to accomplish this goal, such as conducting technical and policy assessments, advising governments, publishing books, holding conferences, generating research reports and more.

Founded: 1980

Steven Nadel, Executive Director
Corinne Abbott, Director of Development

120 American Gas Association (AGA)

400 North Capitol Street NW
Suite 450
Washington, DC 20001
202-824-7000
www.aga.org

The Association represents over 200 local energy companies responsible for delivering natural gas throughout the United States.

Founded: 1918

Karen A. Harbert, President & CEO
Lori Traweek, COO

121 American Petroleum Institute (API)

200 Massachusetts Avenue NW
Suite 1100
Washington, DC 20005-5571
202-682-8000
www.api.org

API is the major national trade association representing all aspects of America's oil and natural gas industry. With over 600 corporate members (including producers, refiners, pipeline operators, and service companies) the association offers a broad range of programs including advocacy, research and statistics, certification, operating standards, and education.

Founded: 1919

Mike Sommers, President & CEO
Amanda Eversole, EVP & COO

122 American Public Power Association

2451 Crystal Drive
Suite 1000
Arlington, VA 22202
202-467-2900
www.publicpower.org

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NASS Highlights

July 2019 • No. 2019-4



2018 AGRICULTURAL CHEMICAL USE Vegetable Crops

About the Survey

The Agricultural Chemical Use Program of USDA's National Agricultural Statistics Service (NASS) is the federal government's official source of statistics about on-farm and post-harvest commercial fertilizer and pesticide use and pest management practices. NASS conducts chemical use surveys as part of the Agricultural Resource Management Survey. NASS conducted the vegetable chemical use survey in the fall of 2018.

Access the Data

For detailed data on each of the 23 vegetables surveyed in 2018, go to <http://bit.ly/AgChem>. Under "2018 Vegetables – released July 24, 2019," click "Data Tables," then select the vegetable for which you want data. For survey methodology information, click "Methodology."

To access data from this survey and previous years, go to the Quick Stats database (<https://quickstats.nass.usda.gov/>).

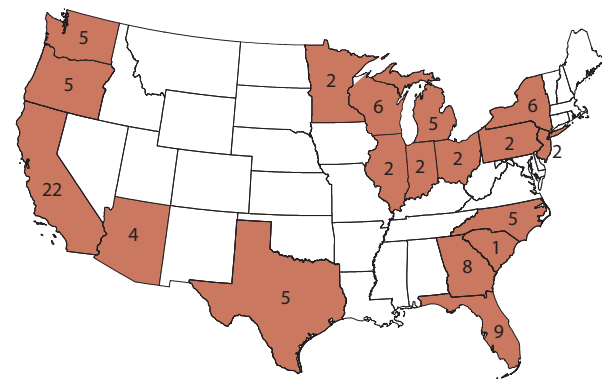
- In Program, select "Survey"
- In Sector, select "Environmental"
- In Group, select "Vegetables"
- In Commodity, select the vegetable(s) you want data for
- Select your category, data item, geographic level, and year

The 2018 Agricultural Chemical Use Survey of vegetable producers collected data about fertilizer and pesticide use as well as pest management practices on acres planted to 23 different vegetable crops. NASS conducted the survey among producers in 18 states, focusing on the states that are major producers for the surveyed crops. (Fig. 1)

Data are for the 2018 crop year, the one-year period beginning after the 2017 harvest and ending after the 2018 harvest. Detailed data are available online for all 23 vegetable

crops (see sidebar for how to access). This document highlights three vegetables: cucumbers, snap beans, and watermelons.

Fig. 1. States in the 2018 Vegetable Chemical Use Survey
(number of crops surveyed in state)



Fertilizer Use

Fertilizer refers to a soil-enriching input that contains one or more plant nutrients, primarily nitrogen (N), phosphate (P₂O₅), potash (K₂O), and sulfur (S). For the 2018 crop year, nitrogen was the most widely applied nutrient for all three featured

vegetables (Table 1), followed by phosphate for cucumbers and watermelons and potash for snap beans.

Table 1. Nitrogen Applied to Planted Acres, Selected Vegetables, 2018 Crop Year

| | % of Acres w Nitrogen Applied | Average Rate (lbs/acre) | Total Applied (mil lbs) |
|------------|-------------------------------|-------------------------|-------------------------|
| Cucumbers | 99 | 257 | 24.6 |
| Snap beans | 88 | 71 | 12.5 |
| Watermelon | 86 | 101 | 9.1 |



United States Department of Agriculture
National Agricultural Statistics Service

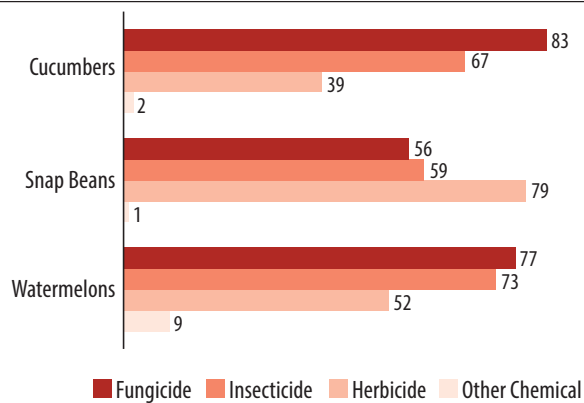
www.nass.usda.gov

Pesticide Use

The pesticide active ingredients used on vegetables are classified as *herbicides* (targeting weeds), *insecticides* (targeting insects), *fungicides* (targeting fungal disease), and *other chemicals* (targeting all other pests and other materials, including extraneous crop foliage).

Fig. 2 shows the proportion of planted acres treated by each type of pesticide for the featured vegetables. The adjacent box shows the top pesticides in each category applied to the vegetables.

Fig. 2. Pesticides Applied to Selected Vegetables, 2018 Crop Year
(% of planted acres)



Pest Management Practices

The survey asked growers to report on the practices they used to manage pests, including weeds, insects, and diseases. Vegetable growers reported practices in four categories. Table 2 shows the top practice in each category.

- *Prevention* practices involve actions to keep a pest population from infesting a crop or field.
- *Avoidance* practices use cultural measures to mitigate or eliminate the detrimental effects of pests.
- *Monitoring* practices involve observing or detecting pests through systematic sampling, counting, or other forms of scouting.
- *Suppression* practices involve controlling or reducing existing pest populations to mitigate crop damage.

Top Pesticides, by percent of planted acres, Selected Vegetables, 2018 Crop Year

| Active Ingredient | % of Acres w Ingredient Applied | Average Rate (lbs/acre) | Total Applied (lbs) |
|---------------------------|---------------------------------|-------------------------|---------------------|
| Fungicides | | | |
| Cucumbers | | | |
| Propamocarb hydrochloride | 51 | 2.385 | 122,200 |
| Chlorothalonil | 38 | 2.977 | 113,700 |
| Snap beans | | | |
| Azoxystrobin | 21 | 0.225 | 9,700 |
| Chlorothalonil | 20 | 1.728 | 70,000 |
| Watermelon | | | |
| Mancozeb | 53 | 5.810 | 310,900 |
| Difenoconazole | 51 | 0.157 | 8,000 |
| Insecticides | | | |
| Cucumbers | | | |
| Bifenthrin | 32 | 0.969 | 30,800 |
| Permethrin | 26 | 0.403 | 10,300 |
| Snap beans | | | |
| Bifenthrin | 44 | 0.096 | 8,500 |
| Lambda-cyhalothrin | 24 | 0.045 | 2,200 |
| Watermelon | | | |
| Imidacloprid | 28 | 0.573 | 15,900 |
| Chlorantraniliprole | 24 | 0.108 | 2,600 |
| Herbicides | | | |
| Cucumbers | | | |
| Ethalfuralin | 36 | 0.714 | 25,700 |
| Halosulfuron-methyl | 17 | 0.029 | 500 |
| Snap beans | | | |
| Bentazon | 39 | 0.556 | 44,500 |
| S- Metolachlor | 35 | 0.988 | 69,900 |
| Watermelon | | | |
| Halosulfuron-methyl | 31 | 0.037 | 1,200 |
| Terbacil | 23 | 0.771 | 17,800 |
| Trifluralin | 23 | 0.754 | 17,100 |

Table 2. Top Practice in Pest Management Category, 2018 Crop Year
(% of planted acres, 23 vegetables)

| | |
|---|----|
| <i>Prevention</i> : Cleaned equipment and implements after field work | 83 |
| <i>Avoidance</i> : Rotated crops during past three years | 86 |
| <i>Monitoring</i> : Scouted for insects and mites | 99 |
| <i>Monitoring</i> : Scouted for diseases | 99 |
| <i>Suppression</i> : Used pesticides with different mechanisms of action to keep pests from becoming resistant to pesticide | 71 |

Table 2 - Land Cover/use of non-Federal rural land, by State and year
In thousands of acres, with margins of error

| State | Year | Cropland | CRP land | Pastureland | Rangeland | Forest land | Other rural land | Total rural land |
|----------|------|-------------------|-------------|-------------------|----------------------|--------------------|-------------------|--------------------|
| Alabama | 1982 | 4,466.9 ±178.3 | -- | 3,798.5 ±185.5 | 52.4 ±47.3 | 20,865.3 ±181.9 | 522.5 ±70.5 | 29,705.6 ±114.0 |
| | 1987 | 3,949.4 ±189.5 | 208.3 -- | 3,633.2 ±156.6 | 48.4 ±45.5 | 21,171.2 ±180.5 | 483.0 ±68.3 | 29,493.5 ±117.4 |
| | 1992 | 3,129.0 ±194.0 | 538.5 -- | 3,760.3 ±151.7 | 48.3 ±45.5 | 21,254.6 ±192.0 | 591.6 ±76.7 | 29,322.3 ±125.3 |
| | 1997 | 2,913.3 ±209.7 | 522.2 -- | 3,576.0 ±135.4 | 49.4 ±46.7 | 21,320.8 ±200.5 | 576.1 ±70.7 | 28,957.8 ±140.8 |
| | 2002 | 2,505.1 ±174.6 | 511.7 -- | 3,479.0 ±190.5 | 46.4 ±109.2 | 21,521.8 ±240.7 | 499.5 ±76.3 | 28,563.5 ±150.7 |
| | 2007 | 2,204.6 ±175.2 | 452.3 -- | 3,479.3 ±191.0 | 46.4 ±109.2 | 21,648.7 ±256.9 | 543.6 ±94.5 | 28,374.9 ±165.1 |
| | 2012 | 2,221.5 ±188.3 | 307.8 -- | 3,358.5 ±197.3 | 46.4 ±109.2 | 21,755.2 ±263.1 | 595.7 ±113.0 | 28,285.1 ±170.7 |
| | 2017 | 2,281.3 ±203.5 | 192.7 -- | 3,279.5 ±247.9 | 46.4 ±109.2 | 21,833.2 ±298.9 | 603.8 ±121.6 | 28,236.9 ±168.8 |
| Arizona | 1982 | 1,250.2 ±152.1 | -- | 89.3 ±51.1 | 33,509.0 ±1,022.3 | 4,606.0 ±859.9 | 1,536.8 ±572.1 | 40,991.3 ±270.7 |
| | 1987 | 1,235.7 ±153.0 | 0.0 -- | 78.8 ±40.2 | 33,535.2 ±1,043.7 | 4,587.0 ±859.3 | 1,612.3 ±591.4 | 41,049.0 ±286.9 |
| | 1992 | 1,215.7 ±146.0 | 0.0 -- | 81.0 ±35.8 | 33,941.9 ±1,064.9 | 4,464.2 ±880.8 | 1,615.4 ±570.0 | 41,318.2 ±295.2 |
| | 1997 | 1,212.2 ±142.1 | 0.0 -- | 74.3 ±34.5 | 33,767.2 ±1,095.7 | 4,403.0 ±891.3 | 1,764.8 ±555.4 | 41,221.5 ±309.3 |
| | 2002 | 947.1 ±130.5 | 0.0 -- | 70.0 ±49.3 | 33,779.1 ±1,139.6 | 4,283.5 ±877.9 | 1,706.6 ±548.9 | 40,786.3 ±344.7 |
| | 2007 | 920.9 ±135.6 | 0.0 -- | 63.9 ±55.1 | 33,632.0 ±1,122.1 | 4,245.0 ±879.8 | 1,720.3 ±539.4 | 40,582.1 ±381.6 |
| | 2012 | 903.2 ±127.2 | 0.0 -- | 63.4 ±59.7 | 33,552.9 ±1,136.5 | 4,230.1 ±872.6 | 1,711.7 ±550.5 | 40,461.3 ±408.6 |
| | 2017 | 906.4 ±121.8 | 0.0 -- | 52.1 ±40.4 | 33,538.5 ±1,141.7 | 4,229.6 ±872.6 | 1,735.3 ±546.0 | 40,461.9 ±416.2 |
| Arkansas | 1982 | 8,039.6 ±438.7 | -- | 5,590.0 ±321.9 | 17.2 ±57.0 | 14,857.4 ±446.3 | 313.4 ±47.9 | 28,817.6 ±102.9 |
| | 1987 | 7,912.5 ±432.9 | 95.9 -- | 5,570.1 ±319.0 | 17.2 ±57.0 | 14,816.8 ±449.4 | 324.8 ±45.5 | 28,737.3 ±107.7 |
| | 1992 | 7,667.8 ±436.1 | 226.8 -- | 5,515.6 ±320.5 | 11.4 ±51.9 | 14,851.8 ±448.4 | 338.3 ±44.6 | 28,611.7 ±111.2 |
| | 1997 | 7,577.2 ±428.0 | 230.4 -- | 5,313.5 ±288.3 | 11.4 ±51.9 | 14,909.1 ±455.5 | 363.0 ±52.0 | 28,404.6 ±109.1 |
| | 2002 | 7,493.2 ±458.8 | 152.4 -- | 5,305.4 ±301.0 | 17.2 ±50.5 | 14,872.5 ±464.6 | 375.8 ±64.7 | 28,216.5 ±117.3 |
| | 2007 | 7,271.4 ±413.6 | 152.3 -- | 5,309.5 ±318.6 | 17.2 ±50.5 | 14,959.8 ±476.2 | 407.6 ±65.3 | 28,117.8 ±122.4 |
| | 2012 | 7,157.3 ±425.3 | 112.9 -- | 5,353.2 ±325.2 | 19.0 ±51.6 | 15,018.5 ±473.3 | 380.8 ±66.5 | 28,041.7 ±123.6 |
| | 2017 | 7,122.6 ±416.3 | 61.7 -- | 5,362.9 ±346.3 | 19.0 ±51.6 | 15,018.9 ±475.4 | 410.3 ±69.8 | 27,995.4 ±119.0 |

Source: U.S. Department of Agriculture, 2017 National Resources Inventory, Summary Report, September 2020

Table 2 - Land Cover/use of non-Federal rural land, by State and year
 In thousands of acres, with margins of error

| State | Year | Cropland | CRP land | Pastureland | Rangeland | Forest land | Other rural land | Total rural land |
|------------|------|--------------------|---------------|-------------------|----------------------|--------------------|-------------------|--------------------|
| California | 1982 | 10,568.1 ±594.1 | -- | 1,284.3 ±227.5 | 21,417.6 ±1,036.2 | 14,777.7 ±697.2 | 1,664.5 ±547.0 | 49,712.2 ±348.2 |
| | 1987 | 10,277.6 ±631.8 | 97.9 -- | 1,388.8 ±266.1 | 21,153.5 ±1,094.5 | 14,812.3 ±728.6 | 1,689.8 ±573.0 | 49,419.9 ±361.4 |
| | 1992 | 10,081.2 ±608.1 | 164.9 -- | 1,082.7 ±239.1 | 20,622.0 ±1,045.8 | 14,611.8 ±745.6 | 1,761.1 ±581.5 | 48,323.7 ±374.6 |
| | 1997 | 9,720.3 ±630.0 | 173.0 -- | 1,041.1 ±217.5 | 20,574.9 ±1,112.4 | 14,434.9 ±730.1 | 1,863.3 ±563.5 | 47,807.5 ±374.2 |
| | 2002 | 9,516.6 ±601.2 | 204.4 -- | 1,189.1 ±195.2 | 19,774.1 ±1,038.7 | 14,253.9 ±717.9 | 1,931.2 ±562.4 | 46,869.3 ±371.9 |
| | 2007 | 9,262.1 ±618.2 | 131.3 -- | 1,238.5 ±214.5 | 19,653.1 ±1,019.5 | 14,117.4 ±716.4 | 1,958.6 ±520.5 | 46,361.0 ±368.5 |
| | 2012 | 9,196.7 ±626.4 | 20.9 -- | 1,316.9 ±194.5 | 19,502.5 ±1,027.0 | 14,068.1 ±713.0 | 2,038.9 ±538.0 | 46,144.0 ±366.6 |
| | 2017 | 9,333.4 ±629.1 | 20.9 -- | 1,203.7 ±195.8 | 19,298.6 ±1,002.6 | 14,074.8 ±708.7 | 2,067.6 ±548.5 | 45,999.0 ±370.3 |
| Caribbean | 1982 | 397.2 ±28.2 | -- | 764.2 ±41.8 | 139.0 ±19.2 | 550.7 ±39.3 | 42.1 ±12.3 | 1,893.2 ±26.9 |
| | 1987 | 371.4 ±27.1 | 0.0 -- | 751.4 ±38.1 | 135.5 ±19.4 | 551.5 ±39.6 | 45.1 ±11.8 | 1,854.9 ±27.5 |
| | 1992 | 359.0 ±30.1 | 0.0 -- | 694.6 ±33.5 | 122.0 ±17.9 | 551.7 ±36.0 | 50.6 ±11.6 | 1,777.9 ±30.2 |
| | 1997 | 357.3 ±30.8 | 0.0 -- | 459.0 ±28.7 | 115.4 ±18.0 | 679.1 ±39.5 | 57.5 ±13.4 | 1,668.3 ±30.6 |
| | 2002 | 338.7 ±34.3 | 0.0 -- | 430.8 ±31.3 | 105.4 ±19.4 | 694.4 ±42.4 | 65.1 ±16.7 | 1,634.4 ±33.7 |
| | 2007 | 259.2 ±40.9 | 0.0 -- | 455.3 ±48.1 | 98.7 ±20.1 | 738.7 ±51.0 | 61.0 ±16.6 | 1,612.9 ±35.0 |
| | 2012 | 257.1 ±48.6 | 0.0 -- | 359.6 ±47.4 | 95.9 ±19.9 | 836.0 ±50.7 | 47.3 ±15.6 | 1,595.9 ±33.6 |
| | 2017 | 252.8 ±52.8 | 0.0 -- | 352.3 ±44.7 | 95.3 ±19.6 | 851.8 ±50.5 | 45.6 ±15.5 | 1,597.8 ±33.2 |
| Colorado | 1982 | 10,533.5 ±629.1 | -- | 1,127.1 ±147.0 | 25,375.4 ±757.3 | 3,887.5 ±433.5 | 546.1 ±154.6 | 41,469.6 ±108.9 |
| | 1987 | 9,637.4 ±665.0 | 1,111.6 -- | 1,124.8 ±141.6 | 24,882.2 ±763.9 | 3,847.1 ±429.2 | 584.7 ±176.6 | 41,187.8 ±140.3 |
| | 1992 | 8,813.5 ±612.4 | 1,913.4 -- | 1,154.7 ±153.0 | 24,770.3 ±770.5 | 3,709.8 ±446.0 | 608.0 ±166.0 | 40,969.7 ±152.2 |
| | 1997 | 8,744.6 ±597.5 | 1,890.1 -- | 1,173.5 ±150.7 | 24,775.2 ±758.0 | 3,676.6 ±444.4 | 603.0 ±167.1 | 40,863.0 ±167.9 |
| | 2002 | 8,198.5 ±565.1 | 2,196.2 -- | 1,043.5 ±126.7 | 24,907.2 ±711.4 | 3,596.8 ±429.8 | 633.8 ±164.1 | 40,576.0 ±188.5 |
| | 2007 | 7,729.0 ±552.1 | 2,450.2 -- | 1,181.4 ±161.7 | 24,807.2 ±705.7 | 3,578.6 ±431.0 | 658.9 ±168.1 | 40,405.3 ±196.3 |
| | 2012 | 7,872.3 ±569.4 | 2,127.2 -- | 1,421.9 ±187.4 | 24,650.1 ±682.0 | 3,559.2 ±428.3 | 665.7 ±163.2 | 40,296.4 ±197.5 |
| | 2017 | 7,991.1 ±605.1 | 1,667.8 -- | 1,734.7 ±266.5 | 24,595.6 ±695.3 | 3,545.6 ±427.8 | 691.4 ±168.8 | 40,226.2 ±198.3 |

Source: U.S. Department of Agriculture, 2017 National Resources Inventory, Summary Report, September 2020

Table 2 - Land Cover/use of non-Federal rural land, by State and year
In thousands of acres, with margins of error

| State | Year | Cropland | CRP land | Pastureland | Rangeland | Forest land | Other rural land | Total rural land |
|-------------|------|-------------------|-------------|-------------------|-------------------|--------------------|-------------------|--------------------|
| Connecticut | 1982 | 228.8 ±38.4 | -- | 115.5 ±23.9 | 0.0 -- | 1,757.4 ±58.0 | 113.8 ±23.7 | 2,215.5 ±35.3 |
| | 1987 | 216.1 ±35.4 | 0.0 -- | 114.9 ±24.6 | 0.0 -- | 1,716.4 ±55.8 | 111.3 ±23.8 | 2,158.7 ±36.5 |
| | 1992 | 212.4 ±35.0 | 0.0 -- | 104.9 ±21.6 | 0.0 -- | 1,688.5 ±54.1 | 106.9 ±21.3 | 2,112.7 ±36.9 |
| | 1997 | 191.7 ±34.3 | 0.0 -- | 103.6 ±21.6 | 0.0 -- | 1,670.7 ±52.3 | 102.4 ±18.1 | 2,068.4 ±35.0 |
| | 2002 | 170.2 ±32.1 | 0.0 -- | 109.0 ±18.8 | 0.0 -- | 1,629.7 ±53.7 | 103.8 ±18.1 | 2,012.7 ±38.7 |
| | 2007 | 171.6 ±32.0 | 0.0 -- | 94.5 ±21.4 | 0.0 -- | 1,613.5 ±56.6 | 104.2 ±18.3 | 1,983.8 ±39.6 |
| | 2012 | 172.5 ±33.9 | 0.0 -- | 92.0 ±20.9 | 0.0 -- | 1,602.8 ±56.6 | 103.8 ±19.8 | 1,971.1 ±39.8 |
| | 2017 | 164.8 ±32.1 | 0.0 -- | 97.0 ±22.7 | 0.0 -- | 1,597.3 ±55.6 | 104.9 ±20.9 | 1,964.0 ±39.4 |
| Delaware | 1982 | 523.9 ±36.6 | -- | 36.5 ±11.3 | 0.0 -- | 373.9 ±43.6 | 115.3 ±26.1 | 1,049.6 ±26.2 |
| | 1987 | 516.3 ±36.4 | 0.0 -- | 31.2 ±10.5 | 0.0 -- | 370.8 ±45.0 | 114.7 ±25.9 | 1,033.0 ±28.8 |
| | 1992 | 504.9 ±36.3 | 0.8 -- | 30.2 ±10.4 | 0.0 -- | 364.9 ±42.9 | 117.1 ±25.2 | 1,017.9 ±29.4 |
| | 1997 | 485.9 ±34.2 | 0.8 -- | 29.0 ±10.6 | 0.0 -- | 360.1 ±40.2 | 121.5 ±25.2 | 997.3 ±30.7 |
| | 2002 | 458.0 ±36.3 | 1.5 -- | 29.6 ±12.1 | 0.0 -- | 350.2 ±37.3 | 121.8 ±26.8 | 961.1 ±33.0 |
| | 2007 | 413.2 ±32.8 | 1.5 -- | 42.4 ±13.6 | 0.0 -- | 344.4 ±35.7 | 130.9 ±28.8 | 932.4 ±35.7 |
| | 2012 | 402.0 ±38.0 | 0.9 -- | 42.8 ±13.5 | 0.0 -- | 347.7 ±38.2 | 125.7 ±27.1 | 919.1 ±36.9 |
| | 2017 | 389.3 ±35.5 | 0.9 -- | 40.1 ±12.6 | 0.0 -- | 351.0 ±36.9 | 126.3 ±27.5 | 907.6 ±38.1 |
| Florida | 1982 | 3,572.1 ±235.2 | -- | 4,324.1 ±249.6 | 4,254.1 ±334.2 | 13,467.9 ±363.9 | 2,389.9 ±308.1 | 28,008.1 ±242.2 |
| | 1987 | 3,197.7 ±245.1 | 91.6 -- | 4,617.8 ±279.9 | 3,906.6 ±349.7 | 13,423.5 ±374.9 | 2,418.0 ±314.2 | 27,655.2 ±249.7 |
| | 1992 | 3,084.2 ±263.0 | 117.8 -- | 4,514.7 ±294.7 | 3,339.6 ±321.1 | 13,385.2 ±367.6 | 2,433.1 ±329.5 | 26,874.6 ±272.5 |
| | 1997 | 2,791.4 ±273.6 | 120.0 -- | 4,454.5 ±333.6 | 3,033.7 ±353.8 | 13,311.4 ±386.5 | 2,484.6 ±330.3 | 26,195.6 ±297.3 |
| | 2002 | 2,863.5 ±283.4 | 91.8 -- | 4,070.8 ±338.9 | 2,726.1 ±334.9 | 13,367.0 ±368.3 | 2,512.7 ±331.7 | 25,631.9 ±315.1 |
| | 2007 | 2,752.4 ±307.9 | 71.4 -- | 3,915.7 ±365.6 | 2,526.1 ±330.5 | 13,249.0 ±340.4 | 2,660.0 ±324.6 | 25,174.6 ±331.5 |
| | 2012 | 2,762.7 ±303.8 | 35.7 -- | 3,867.1 ±373.6 | 2,482.0 ±333.7 | 13,209.3 ±341.8 | 2,640.0 ±332.7 | 24,996.8 ±335.0 |
| | 2017 | 2,681.2 ±330.0 | 27.5 -- | 3,795.0 ±439.3 | 2,466.5 ±329.7 | 13,222.1 ±343.4 | 2,660.3 ±332.7 | 24,852.6 ±341.7 |

Source: U.S. Department of Agriculture, 2017 National Resources Inventory, Summary Report, September 2020

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In thousands of acres, with margins of error

| State | Year | Cropland | CRP land | Pastureland | Rangeland | Forest land | Other rural land | Total rural land |
|---------|------|-------------------|-------------|-------------------|-------------------|--------------------|------------------|--------------------|
| Georgia | 1982 | 6,602.4 ±208.5 | -- | 2,963.3 ±164.6 | 0.0 -- | 22,066.1 ±386.6 | 892.6 ±114.6 | 32,524.4 ±117.9 |
| | 1987 | 5,962.9 ±205.6 | 293.2 -- | 2,942.7 ±141.9 | 0.0 -- | 22,204.0 ±362.7 | 865.8 ±111.0 | 32,268.6 ±131.0 |
| | 1992 | 5,163.4 ±254.6 | 616.7 -- | 3,054.7 ±149.9 | 0.0 -- | 22,077.2 ±388.6 | 867.4 ±105.8 | 31,779.4 ±143.6 |
| | 1997 | 4,751.9 ±188.2 | 595.3 -- | 2,931.1 ±164.1 | 0.0 -- | 21,855.5 ±371.4 | 851.6 ±121.0 | 30,985.4 ±155.8 |
| | 2002 | 4,453.4 ±204.6 | 245.0 -- | 2,888.9 ±172.3 | 0.0 -- | 22,010.0 ±363.2 | 844.1 ±121.9 | 30,441.4 ±186.6 |
| | 2007 | 4,254.9 ±251.4 | 215.6 -- | 2,847.3 ±207.8 | 0.0 -- | 21,929.1 ±368.1 | 886.0 ±130.8 | 30,132.9 ±198.4 |
| | 2012 | 4,283.2 ±257.5 | 121.6 -- | 2,779.8 ±208.4 | 0.0 -- | 21,876.7 ±389.4 | 931.7 ±137.0 | 29,993.0 ±203.4 |
| | 2017 | 4,444.0 ±268.6 | 95.4 -- | 2,627.6 ±204.6 | 0.0 -- | 21,759.8 ±390.0 | 912.3 ±138.7 | 29,839.1 ±208.9 |
| Hawaii | 1982 | 285.5 ±74.8 | -- | 67.0 ±23.2 | 1,176.2 ±154.1 | 1,581.2 ±166.5 | 435.5 ±192.7 | 3,545.4 ±33.2 |
| | 1987 | 280.5 ±73.0 | 0.0 -- | 58.3 ±22.6 | 1,162.7 ±155.3 | 1,546.6 ±166.8 | 419.8 ±192.5 | 3,467.9 ±33.5 |
| | 1992 | 263.3 ±70.8 | 0.0 -- | 58.7 ±21.1 | 1,168.5 ±152.8 | 1,540.8 ±168.5 | 413.8 ±196.0 | 3,445.1 ±37.0 |
| | 1997 | 233.8 ±61.1 | 0.0 -- | 60.5 ±21.1 | 1,163.3 ±153.7 | 1,558.9 ±161.0 | 449.6 ±191.4 | 3,466.1 ±36.6 |
| | 2002 | 155.5 ±53.6 | 0.0 -- | 94.5 ±19.8 | 1,188.9 ±145.3 | 1,550.8 ±163.1 | 452.9 ±188.7 | 3,442.6 ±38.6 |
| | 2007 | 109.3 ±61.6 | 0.0 -- | 102.7 ±23.0 | 1,144.3 ±144.9 | 1,481.8 ±162.9 | 437.1 ±188.4 | 3,275.2 ±40.3 |
| | 2012 | 94.2 ±60.0 | 0.0 -- | 107.4 ±27.2 | 1,144.2 ±143.4 | 1,470.7 ±166.3 | 431.7 ±192.7 | 3,248.2 ±40.6 |
| | 2017 | 78.7 ±54.7 | 0.0 -- | 118.3 ±29.5 | 1,144.1 ±141.9 | 1,467.9 ±167.5 | 429.5 ±193.2 | 3,238.5 ±41.0 |
| Idaho | 1982 | 6,432.6 ±320.7 | -- | 1,237.2 ±164.0 | 6,830.1 ±346.4 | 4,045.0 ±349.9 | 363.3 ±106.4 | 18,908.2 ±52.7 |
| | 1987 | 6,111.5 ±312.9 | 441.5 -- | 1,232.4 ±147.7 | 6,744.8 ±336.4 | 4,135.0 ±347.9 | 386.3 ±105.0 | 19,051.5 ±55.4 |
| | 1992 | 5,659.0 ±315.6 | 817.6 -- | 1,244.0 ±160.7 | 6,713.8 ±341.1 | 4,056.3 ±350.3 | 398.9 ±109.0 | 18,889.6 ±60.3 |
| | 1997 | 5,540.6 ±314.5 | 784.2 -- | 1,268.9 ±158.4 | 6,700.5 ±346.5 | 4,033.6 ±342.8 | 414.6 ±109.6 | 18,742.4 ±66.4 |
| | 2002 | 5,443.6 ±317.9 | 743.2 -- | 1,289.8 ±155.0 | 6,707.0 ±355.8 | 4,060.2 ±326.1 | 424.6 ±104.3 | 18,668.4 ±69.6 |
| | 2007 | 5,279.7 ±352.7 | 761.9 -- | 1,326.9 ±177.6 | 6,723.6 ±371.7 | 4,062.6 ±326.6 | 448.0 ±112.7 | 18,602.7 ±75.7 |
| | 2012 | 5,355.5 ±336.6 | 498.2 -- | 1,448.1 ±170.9 | 6,766.8 ±369.7 | 4,051.7 ±327.0 | 452.7 ±112.9 | 18,573.0 ±77.6 |
| | 2017 | 5,423.3 ±333.0 | 401.5 -- | 1,399.9 ±172.5 | 6,799.0 ±372.0 | 4,047.7 ±327.2 | 469.4 ±110.6 | 18,540.8 ±82.4 |

Source: U.S. Department of Agriculture, 2017 National Resources Inventory, Summary Report, September 2020

Table 2 - Land Cover/use of non-Federal rural land, by State and year
 In thousands of acres, with margins of error

| State | Year | Cropland | CRP land | Pastureland | Rangeland | Forest land | Other rural land | Total rural land |
|----------|------|--------------------|---------------|-------------------|-----------|-------------------|------------------|--------------------|
| Illinois | 1982 | 24,724.2 ±263.0 | -- | 3,201.9 ±222.4 | 0.0 -- | 3,632.9 ±170.2 | 656.5 ±35.3 | 32,215.5 ±127.1 |
| | 1987 | 24,690.8 ±253.1 | 120.0 -- | 2,951.2 ±209.1 | 0.0 -- | 3,662.3 ±167.0 | 658.6 ±37.2 | 32,082.9 ±132.4 |
| | 1992 | 24,106.5 ±245.5 | 703.7 -- | 2,791.8 ±204.6 | 0.0 -- | 3,720.7 ±168.7 | 651.4 ±36.9 | 31,974.1 ±132.5 |
| | 1997 | 24,030.3 ±213.4 | 725.6 -- | 2,531.7 ±192.8 | 0.0 -- | 3,817.1 ±161.8 | 636.0 ±46.1 | 31,740.7 ±128.6 |
| | 2002 | 24,092.4 ±247.4 | 613.0 -- | 2,300.3 ±189.6 | 0.0 -- | 3,951.3 ±170.2 | 634.1 ±37.7 | 31,591.1 ±139.1 |
| | 2007 | 23,828.6 ±249.6 | 665.9 -- | 2,306.6 ±174.0 | 0.0 -- | 3,988.0 ±171.8 | 658.0 ±45.9 | 31,447.1 ±145.1 |
| | 2012 | 23,844.2 ±255.6 | 543.9 -- | 2,275.1 ±177.4 | 0.0 -- | 4,049.2 ±174.8 | 664.9 ±52.6 | 31,377.3 ±150.2 |
| | 2017 | 23,957.8 ±244.2 | 327.7 -- | 2,276.8 ±162.7 | 0.0 -- | 4,080.9 ±175.8 | 670.2 ±53.7 | 31,313.4 ±150.3 |
| Indiana | 1982 | 13,802.6 ±188.4 | -- | 2,200.4 ±122.3 | 0.0 -- | 3,814.0 ±144.0 | 726.1 ±72.8 | 20,543.1 ±92.2 |
| | 1987 | 13,890.9 ±197.1 | 140.9 -- | 1,892.6 ±115.4 | 0.0 -- | 3,827.9 ±143.0 | 667.9 ±69.9 | 20,420.2 ±94.5 |
| | 1992 | 13,551.0 ±202.9 | 411.5 -- | 1,841.3 ±115.9 | 0.0 -- | 3,831.4 ±145.9 | 674.1 ±73.5 | 20,309.3 ±103.1 |
| | 1997 | 13,435.1 ±224.9 | 377.9 -- | 1,845.2 ±110.7 | 0.0 -- | 3,820.3 ±146.5 | 643.0 ±62.6 | 20,121.5 ±114.9 |
| | 2002 | 13,353.4 ±219.0 | 207.4 -- | 1,932.3 ±119.6 | 0.0 -- | 3,852.3 ±154.6 | 620.2 ±66.1 | 19,965.6 ±122.1 |
| | 2007 | 13,227.7 ±235.9 | 172.9 -- | 1,915.0 ±131.7 | 0.0 -- | 3,889.2 ±155.8 | 635.7 ±78.2 | 19,840.5 ±128.0 |
| | 2012 | 13,274.3 ±241.1 | 109.3 -- | 1,836.1 ±129.9 | 0.0 -- | 3,921.3 ±155.7 | 633.9 ±82.6 | 19,774.9 ±130.9 |
| | 2017 | 13,324.0 ±240.3 | 73.2 -- | 1,745.9 ±145.2 | 0.0 -- | 3,931.2 ±163.0 | 649.3 ±85.4 | 19,723.6 ±132.3 |
| Iowa | 1982 | 26,380.4 ±249.5 | -- | 4,525.6 ±184.3 | 0.0 -- | 1,909.4 ±139.8 | 926.1 ±59.9 | 33,741.5 ±95.6 |
| | 1987 | 25,649.7 ±237.3 | 1,240.1 -- | 3,952.7 ±187.4 | 0.0 -- | 1,981.0 ±139.9 | 887.1 ±59.4 | 33,710.6 ±101.4 |
| | 1992 | 24,906.0 ±229.4 | 2,091.0 -- | 3,694.7 ±195.6 | 0.0 -- | 2,117.9 ±147.9 | 861.0 ±59.7 | 33,670.6 ±102.0 |
| | 1997 | 25,209.7 ±234.3 | 1,739.0 -- | 3,538.8 ±186.8 | 0.0 -- | 2,210.3 ±149.3 | 871.2 ±60.2 | 33,569.0 ±104.3 |
| | 2002 | 25,353.2 ±212.0 | 1,510.0 -- | 3,419.5 ±155.6 | 0.0 -- | 2,340.9 ±147.5 | 854.2 ±73.2 | 33,477.8 ±107.8 |
| | 2007 | 25,415.6 ±207.4 | 1,427.5 -- | 3,307.4 ±147.3 | 0.0 -- | 2,380.4 ±139.5 | 876.3 ±77.7 | 33,407.2 ±115.5 |
| | 2012 | 25,788.6 ±221.5 | 1,029.6 -- | 3,237.3 ±167.2 | 0.0 -- | 2,414.6 ±144.0 | 890.1 ±81.0 | 33,360.2 ±120.3 |
| | 2017 | 25,966.6 ±221.1 | 697.8 -- | 3,346.5 ±195.8 | 0.0 -- | 2,435.4 ±144.4 | 886.6 ±82.2 | 33,332.9 ±122.1 |

Source: U.S. Department of Agriculture, 2017 National Resources Inventory, Summary Report, September 2020

Acronyms & Abbreviations

A

| | | |
|--|---|--|
| A&I: Alternative and Innovative (Wastewater Treatment System) | AEERL: Air and Energy Engineering Research Laboratory | AP: Accounting Point |
| AA: Accountable Area; Adverse Action; Advices of Allowance; Assistant Administrator; Associate Administrator; Atomic Absorption | AEM: Acoustic Emission Monitoring | APA: Administrative Procedures Act |
| AAEE: American Academy of Environmental Engineers | AERE: Association of Environmental and Resource Economists | APCA: Air Pollution Control Association |
| AANWR: Alaskan Arctic National Wildlife Refuge | AES: Auger Electron Spectrometry | APCD: Air Pollution Control District |
| AAP: Asbestos Action Program | AFA: American Forestry Association | APDS: Automated Procurement Documentation System |
| AAPCO: American Association of Pesticide Control Officials | AFCA: Area Fuel Consumption Allocation | APHA: American Public Health Association |
| AARC: Alliance for Acid Rain Control | AFCEE: Air Force Center for Environmental Excellence | APRAC: Urban Diffusion Model for Carbon Monoxide from Motor Vehicle Traffic |
| ABEL: EPA's computer model for analyzing a violator's ability to pay a civil penalty. | AFS: AIRS Facility Subsystem | APTI: Air Pollution Training Institute |
| ABES: Alliance for Balanced Environmental Solutions | AFUG: AIRS Facility Users Group | APWA: American Public Works Association |
| AC: Actual Commitment. Advisory Circular | AH: Allowance Holders | AQ-7: Non-reactive Pollutant Modelling |
| A&C: Abatement and Control | AHERA: Asbestos Hazard Emergency Response Act | AQCCT: Air-Quality Criteria and Control Techniques |
| ACA: American Conservation Association | AHU: Air Handling Unit | AQCP: Air Quality Control Program |
| ACBM: Asbestos-Containing Building Material | AI: Active Ingredient | AQCR: Air-Quality Control Region |
| ACE: Alliance for Clean Energy | AIC: Active to Inert Conversion | AQD: Air-Quality Digest |
| ACE: Any Credible Evidence | AICUZ: Air Installation Compatible Use Zones | AQDHS: Air-Quality Data Handling System |
| ACEEE: American Council for an Energy Efficient Economy | AID: Agency for International Development | AQDM: Air-Quality Display Model |
| ACFM: Actual Cubic Feet Per Minute | AIHC: American Industrial Health Council | AQMA: Air-Quality Maintenance Area |
| ACL: Alternate Concentration Limit. Analytical Chemistry Laboratory | AIP: Auto Ignition Point | AQMD: Air Quality Management District |
| ACM: Asbestos-Containing Material | AIRMON: Atmospheric Integrated Research Monitoring Network | AQMP: Air-Quality Maintenance Plan; Air-Quality Management Plan |
| ACP: Agriculture Control Program (Water Quality Management); ACP: Air Carcinogen Policy | AIRS: Aerometric Information Retrieval System | AQSM: Air-Quality Simulation Model |
| ACQUIRE: Aquatic Information Retrieval | AL: Acceptable Level | AQTAD: Air-Quality Technical Assistance Demonstration |
| ACQR: Air Quality Control Region | ALA: Delta-Aminolevulinic Acid | AR: Administrative Record |
| ACS: American Chemical Society | ALA-O: Delta-Aminolevulinic Acid Dehydrates | A&R: Air and Radiation |
| ACT: Action | ALAPO: Association of Local Air Pollution Control Officers | ARA: Assistant Regional Administrator; Associate Regional Administrator |
| ACTS: Asbestos Contractor Tracking System | ALARA: As Low As Reasonably Achievable | ARAC: Acid Rain Advisory Committee |
| ACWA: American Clean Water Association | ALC: Application Limiting Constituent | ARAR: Applicable or Relevant and Appropriate Standards, Limitations, Criteria, and Requirements |
| ACWM: Asbestos-Containing Waste Material | ALJ: Administrative Law Judge | ARB: Air Resources Board |
| ADABA: Acceptable Data Base | ALMS: Atomic Line Molecular Spectroscopy | ARC: Agency Ranking Committee |
| ADB: Applications Data Base | ALR: Action Leakage Rate | ARCC: American Rivers Conservation Council |
| ADI: Acceptable Daily Intake | AMBIENS: Atmospheric Mass Balance of Industrially Emitted and Natural Sulfur | ARCS: Alternative Remedial Contract Strategy |
| ADP: AHERA Designated Person; Automated Data Processing | AMOS: Air Management Oversight System | ARG: American Resources Group |
| ADQ: Audits of Data Quality | AMPS: Automatic Mapping and Planning System | ARIP: Accidental Release Information Program |
| ADR: Alternate Dispute Resolution | AMSA: Association of Metropolitan Sewer Agencies | ARL: Air Resources Laboratory |
| ADSS: Air Data Screening System | ANC: Acid Neutralizing Capacity | ARM: Air Resources Management |
| ADT: Average Daily Traffic | ANPR: Advance Notice of Proposed Rulemaking | ARNEWS: Acid Rain National Early Warning Systems |
| AEA: Atomic Energy Act | ANRHRD: Air, Noise, & Radiation Health Research Division/ORD | ARO: Alternate Regulatory Option |
| AEC: Associate Enforcement Counsels | ANSS: American Nature Study Society | ARRP: Acid Rain Research Program |
| AEE: Alliance for Environmental Education | AOAC: Association of Official Analytical Chemists | ARRPA: Air Resources Regional Pollution Assessment Model |
| | AOC: Abnormal Operating Conditions | ARS: Agricultural Research Service |
| | AOD: Argon-Oxygen Decarbonization | ARZ: Auto Restricted Zone |
| | AOML: Atlantic Oceanographic and Meteorological Laboratory | AS: Area Source |
| | | ASC: Area Source Category |

Glossary of Environmental Terms

A

Abandoned Well: A well whose use has been permanently discontinued or which is in a state of such disrepair that it cannot be used for its intended purpose.

Abatement: Reducing the degree or intensity of, or eliminating, pollution.

Abatement Debris: Waste from remediation activities.

Absorbed Dose: In exposure assessment, the amount of a substance that penetrates an exposed organism's absorption barriers (e.g. skin, lung tissue, gastrointestinal tract) through physical or biological processes. The term is synonymous with internal dose.

Absorption: The uptake of water, other fluids, or dissolved chemicals by a cell or an organism (as tree roots absorb dissolved nutrients in soil.)

Absorption Barrier: Any of the exchange sites of the body that permit uptake of various substances at different rates (e.g. skin, lung tissue, and gastrointestinal-tract wall)

Accident Site: The location of an unexpected occurrence, failure or loss, either at a plant or along a transportation route, resulting in a release of hazardous materials.

Acclimatization: The physiological and behavioral adjustments of an organism to changes in its environment.

Acid: A corrosive solution with a pH less than 7.

Acid Aerosol: Acidic liquid or solid particles small enough to become airborne. High concentrations can irritate the lungs and have been associated with respiratory diseases like asthma.

Acid Deposition: A complex chemical and atmospheric phenomenon that occurs when emissions of sulfur and nitrogen compounds and other substances are transformed by chemical processes in the atmosphere, often far from the original sources, and then deposited on earth in either wet or dry form. The wet forms, popularly called "acid rain," can fall to earth as rain, snow, or fog. The dry forms are acidic gases or particulates.

Acid Mine Drainage: Drainage of water from areas that have been mined for coal or other mineral ores. The water has a low pH because of its contact with sulfur-bearing material and is harmful to aquatic organisms.

Acid Neutralizing Capacity: Measure of ability of a base (e.g. water or soil) to resist changes in pH.

Acid Rain: (See: acid deposition.)

Acidic: The condition of water or soil that contains a sufficient amount of acid substances to lower the pH below 7.0.

Action Levels: 1. Regulatory levels recommended by EPA for enforcement by FDA and USDA when pesticide residues occur in food or feed commodities for reasons other than the direct application of the pesticide. As opposed to "tolerances" which are established for residues occurring as a direct result of proper usage, action levels are set for inadvertent residues resulting from previous legal use or accidental contamination. 2. In the Superfund program, the existence of a contaminant concentration in the environment high enough to warrant action or trigger a response under SARA and the National Oil and Hazardous Substances Contingency Plan. The term is also

used in other regulatory programs. (See: tolerances.)

Activated Carbon: A highly adsorbent form of carbon used to remove odors and toxic substances from liquid or gaseous emissions. In waste treatment, it is used to remove dissolved organic matter from waste drinking water. It is also used in motor vehicle evaporative control systems.

Activated Sludge: Product that results when primary effluent is mixed with bacteria-laden sludge and then agitated and aerated to promote biological treatment, speeding the breakdown of organic matter in raw sewage undergoing secondary waste treatment.

Activator: A chemical added to a pesticide to increase its activity.

Active Ingredient: In any pesticide product, the component that kills, or otherwise controls, target pests. Pesticides are regulated primarily on the basis of active ingredients.

Activity Plans: Written procedures in a school's asbestos-management plan that detail the steps a Local Education Agency (LEA) will follow in performing the initial and additional cleaning, operation and maintenance-program tasks; periodic surveillance; and reinspection required by the Asbestos Hazard Emergency Response Act (AHERA).

Acute Effect: An adverse effect on any living organism which results in severe symptoms that develop rapidly; symptoms often subside after the exposure stops.

Acute Exposure: A single exposure to a toxic substance which may result in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day, as compared to longer, continuing exposure over a period of time.

Acute Toxicity: The ability of a substance to cause severe biological harm or death soon after a single exposure or dose. Also, any poisonous effect resulting from a single short-term exposure to a toxic substance. (See: chronic toxicity, toxicity.)

Adaptation: Changes in an organism's physiological structure or function or habits that allow it to survive in new surroundings.

Add-on Control Device: An air pollution control device such as carbon absorber or incinerator that reduces the pollution in an exhaust gas. The control device usually does not affect the process being controlled and thus is "add-on" technology, as opposed to a scheme to control pollution through altering the basic process itself.

Adequately Wet: Asbestos containing material that is sufficiently mixed or penetrated with liquid to prevent the release of particulates.

Administered Dose: In exposure assessment, the amount of a substance given to a test subject (human or animal) to determine dose-response relationships. Since exposure to chemicals is usually inadvertent, this quantity is often called potential dose.

Administrative Order: A legal document signed by EPA directing an individual, business, or other entity to take corrective action or refrain from an activity. It describes the violations and actions to be taken, and can be enforced in court. Such orders may be issued, for example, as a result of an administrative complaint whereby the respondent is ordered to pay a penalty for violations of a statute.

Administrative Order On Consent: A legal agreement signed by EPA and an individual, business, or other entity through which the violator agrees to pay for correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court.

Administrative Procedures Act: A law that spells out procedures and requirements related to the promulgation of regulations.

Administrative Record: All documents which EPA considered or relied on in selecting the response action at a Superfund site, culminating in the record of decision for remedial action or, an action memorandum for removal actions.

Adsorption: Removal of a pollutant from air or water by collecting the pollutant on the surface of a solid material; e.g., an advanced method of treating waste in which activated carbon removes organic matter from waste-water.

Adulterants: Chemical impurities or substances that by law do not belong in a food, or pesticide.

Adulterated: 1. Any pesticide whose strength or purity falls below the quality stated on its label. 2. A food, feed, or product that contains illegal pesticide residues.

Advanced Treatment: A level of wastewater treatment more stringent than secondary treatment; requires an 85-percent reduction in conventional pollutant concentration or a significant reduction in non-conventional pollutants. Sometimes called tertiary treatment.

Advanced Wastewater Treatment: Any treatment of sewage that goes beyond the secondary or biological water treatment stage and includes the removal of nutrients such as phosphorus and nitrogen and a high percentage of suspended solids. (See primary, secondary treatment.)

Adverse Effects Data: FIFRA requires a pesticide registrant to submit data to EPA on any studies or other information regarding unreasonable adverse effects of a pesticide at any time after its registration.

Advisory: A non-regulatory document that communicates risk information to those who may have to make risk management decisions.

Aerated Lagoon: A holding and/or treatment pond that speeds up the natural process of biological decomposition of organic waste by stimulating the growth and activity of bacteria that degrade organic waste.

Aeration: A process which promotes biological degradation of organic matter in water. The process may be passive (as when waste is exposed to air), or active (as when a mixing or bubbling device introduces the air).

Aeration Tank: A chamber used to inject air into water.

Aerobic: Life or processes that require, or are not destroyed by, the presence of oxygen. (See: anaerobic.)

Aerobic Treatment: Process by which microbes decompose complex organic compounds in the presence of oxygen and use the liberated energy for reproduction and growth. (Such processes include extended aeration, trickling filtration, and rotating biological contactors.)

Aerosol: 1. Small droplets or particles suspended in the atmosphere, typically containing sulfur. They

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