

**U.S. Climate Action Report**

# 2010

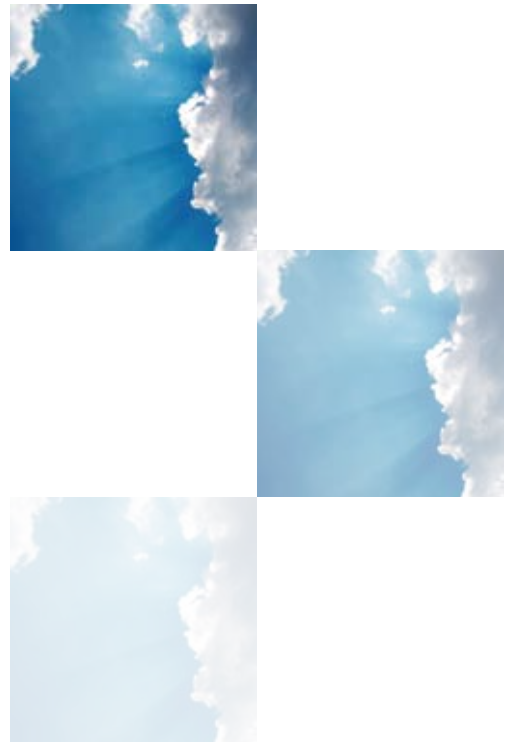
*Fifth National Communication  
of the United States of America  
Under the United Nations Framework  
Convention on Climate Change*



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## Acronyms and Abbreviations

<b>3D-VIEW</b>	three-dimensional Virtual Interactive Environmental Worlds	<b>BFI</b>	Biofuels Initiative
<b>AAVP</b>	ARM Aerial Vehicles Program	<b>BIE</b>	Bureau of Indian Education
<b>AAVSHTO</b>	American Association of State Highway Transportation Officials	<b>BLM</b>	Bureau of Land Management
<b>ac</b>	acre	<b>BOR</b>	Bureau of Reclamation
<b>ACRF</b>	Atmospheric Radiation Measurement Climate Research Facility	<b>BRDI</b>	Biomass Research and Development Initiative
<b>ADAGE</b>	Applied Dynamic Analysis of the Global Economy	<b>BTS</b>	Bureau of Transportation Statistics
<b>AEO</b>	<i>Annual Energy Outlook</i>	<b>Btu</b>	British thermal unit
<b>AERONET</b>	AErosol RObotic NETwork	<b>°C</b>	degree Centigrade
<b>AFCI</b>	Advanced Fuel Cycle Initiative	<b>C<sub>2</sub>F<sub>6</sub></b>	hexafluoroethane
<b>AGAGE</b>	Advanced Global Atmospheric Gases Experiment	<b>C<sub>4</sub>F<sub>10</sub></b>	perfluorobutane
<b>AIRS</b>	Atmospheric InfraRed Sounder	<b>C<sub>6</sub>F<sub>14</sub></b>	perfluorohexane
<b>ALU</b>	agriculture and land use	<b>C&amp;D</b>	commercialization and deployment
<b>AMS</b>	American Meteorological Society	<b>CAAFI</b>	Commercial Aviation Alternative Fuels Initiative
<b>ANL</b>	Argonne National Laboratory	<b>CAFE</b>	Corporate Average Fuel Economy
<b>AON</b>	Arctic Observing Network	<b>CALIPSO</b>	Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation
<b>APP</b>	Asia-Pacific Partnership on Clean Development and Climate	<b>CAR</b>	<i>U.S. Climate Action Report</i>
<b>ARM</b>	Atmospheric Radiation Measurement	<b>CATHALAC</b>	Water Center for the Humid Tropics of Latin America and the Caribbean
<b>ARPA-E</b>	Advanced Research and Projects Agency–Energy	<b>CBI</b>	Net-Zero Energy Commercial Building Initiative
<b>ARRA</b>	American Recovery and Reinvestment Act of 2009	<b>CBM</b>	coalbed methane
<b>ARS</b>	Agricultural Research Service	<b>CCCSTI</b>	Committee on Climate Change Science and Technology Integration
<b>A-Train</b>	Afternoon Train	<b>CCD</b>	Climate Change Division
<b>AZA</b>	Association of Zoos and Aquariums	<b>CCLI</b>	Course, Curriculum, and Laboratory Improvement
<b>BCF</b>	billion cubic feet	<b>CCPI</b>	Clean Coal Power Initiative
<b>BEA</b>	Bureau of Economic Analysis	<b>CCRI</b>	Climate Change Research Initiative
<b>BER</b>	Office of Biological and Environmental Research	<b>CCS</b>	carbon capture and sequestration
		<b>CCSP</b>	U.S. Climate Change Science Program



<b>CCTP</b>	Climate Change Technology Program	<b>GOP</b>	Conference of the Parties
<b>CDCP</b>	Clean Development and Climate Program	<b>CPO</b>	Climate Program Office
<b>CEA</b>	Council of Economic Advisers	<b>CPT</b>	Climate Process and Modeling Teams
<b>CENR</b>	Committee on Environment and Natural Resources	<b>CRC–URI</b>	The Coastal Resources Center at the University of Rhode Island
<b>CEQ</b>	Council on Environmental Quality	<b>CrIS</b>	Cross-track Infrared Sounder
<b>CERES</b>	Clouds and the Earth’s Radiant Energy System	<b>CRN</b>	Climate Reference Network
<b>CESN</b>	Climate Effects Science Network	<b>CRP</b>	Conservation Reserve Program
<b>CFC</b>	chlorofluorocarbon	<b>CSLF</b>	Carbon Sequestration Leadership Forum
<b>CFP</b>	Climate Friendly Parks	<b>CSP</b>	Conservation Stewardship Program
<b>CH<sub>4</sub></b>	methane	<b>CSREES</b>	Cooperative State Research, Education, and Extension Service
<b>CHE</b>	NSF Division of Chemistry	<b>CTA</b>	conservation technical assistance
<b>CHECK</b>	Climate Change Emission Calculator Kit	<b>CTI</b>	Climate Technology Initiative
<b>CHP</b>	combined heat and power	<b>CTI</b>	Coral Triangle Initiative
<b>CIFs</b>	Climate Investment Funds	<b>CTIC</b>	Conservation Technology Information Center
<b>CIG</b>	Climate Impacts Group	<b>DAAC</b>	Distributed Active Archive Center
<b>CIWG</b>	Communications Interagency Working Group	<b>DCA</b>	Development Credit Authority
<b>CLASS</b>	Comprehensive Large Array-data Stewardship System	<b>DEP</b>	Department of Environmental Protection
<b>CLD</b>	Climate and Large-scale Dynamics	<b>DERA</b>	Diesel Emissions Reduction Act
<b>CLIMAS</b>	Climate Assessment for the Southwest	<b>DMR</b>	NSF Division of Materials Research
<b>CLIP</b>	Climate Leadership In Parks	<b>DMS</b>	NSF Division of Mathematical Science
<b>CMAQ</b>	Congestion Mitigation and Air Quality	<b>DOC</b>	U.S. Department of Commerce
<b>CMG</b>	Collaboration in Mathematical Geosciences	<b>DOD</b>	U.S. Department of Defense
<b>CMOP</b>	Coalbed Methane Outreach Program	<b>DOE</b>	U.S. Department of Energy
<b>CNES</b>	Centre National d’Etudes Spatiales	<b>DOI</b>	U.S. Department of the Interior
<b>CNRS</b>	Centre Nationale de Recherche Scientifique	<b>DOS</b>	U.S. Department of State
<b>CO</b>	carbon monoxide	<b>DOT</b>	U.S. Department of Transportation
<b>CO<sub>2</sub></b>	carbon dioxide	<b>ECO-Asia</b>	Environmental Cooperation–Asia
<b>CO<sub>2</sub> Eq.</b>	carbon dioxide equivalents	<b>ECV</b>	essential climate variable
<b>COL</b>	combined license	<b>EDA</b>	Economic Development Administration
<b>CommEd</b>	Communications and Education	<b>EDG</b>	EOS Data Gateway
		<b>EECBG</b>	Energy Efficiency and Conservation Block Grant

<b>EEP</b>	Environmental Exports Program	<b>FRPP</b>	Farm and Ranchlands Protection Program
<b>EFRC</b>	Energy Frontier Research Center	<b>FSA</b>	Farm Service Agency
<b>EFRI</b>	Emerging Frontiers in Research and Innovation	<b>FTA</b>	Federal Transit Administration
<b>EGS</b>	enhanced geothermal systems	<b>FWS</b>	U.S. Fish and Wildlife Service
<b>EHE</b>	excessive heat event	<b>FY</b>	fiscal year
<b>EIA</b>	Energy Information Administration	<b>G8</b>	Group of Eight
<b>EIS</b>	Environmental Impact Statement	<b>GAW</b>	Global Atmospheric Watch
<b>EISA</b>	Energy Independence and Security Act of 2007	<b>GBEP</b>	Global Bioenergy Partnership
<b>EOS</b>	Earth Observing System	<b>GCCE</b>	Global Climate Change Education
<b>EOSDIS</b>	Earth Observing System Data and Information System	<b>GCCI</b>	<i>Global Climate Change Impacts in the United States</i>
<b>EPA</b>	U.S. Environmental Protection Agency	<b>GCEP</b>	Global Change Education Program
<b>EPAct</b>	Energy Policy Act of 2005	<b>GCOS</b>	Global Climate Observing System
<b>Eq.</b>	equivalents	<b>GCRA</b>	Global Change Research Act
<b>EQIP</b>	Environmental Quality Incentives Program	<b>GDA</b>	Global Development Alliance
<b>ESP</b>	early site permit	<b>GDP</b>	gross domestic product
<b>ESSEA</b>	Earth System Science Education Alliance	<b>GEF</b>	Global Environment Facility
<b>ETBC</b>	Emerging Topics in Biogeochemical Cycles	<b>Gen IV</b>	Generation IV Nuclear Energy Systems
<b>EUGENE</b>	Ecological Understanding as a Guideline for Evaluation of Nonformal Education	<b>GEO</b>	Intergovernmental Group on Earth Observations
<b>EUMETSAT</b>	European Organisation for the Exploitation of Meteorological Satellites	<b>GEOSS</b>	Global Earth Observation System of Systems
<b>Ex-Im</b>	Export-Import Bank	<b>Gg</b>	gigagram
<b>°F</b>	degree Fahrenheit	<b>GHG</b>	greenhouse gas
<b>FAA</b>	Federal Aviation Administration	<b>GIF</b>	Generation IV International Forum
<b>FCCA</b>	Forest, Climate & Community Alliance	<b>GIS</b>	geographic information system
<b>FCPF</b>	Forest Carbon Partnership Facility	<b>GLOBE</b>	Global Learning and Observations to Benefit the Environment
<b>FEMP</b>	Federal Energy Management Program	<b>GLOBEC</b>	Global Ocean Ecosystems Dynamics
<b>FEWS NET</b>	Famine Early Warning Systems Network	<b>GLOSS</b>	Global Sea Level Observing System
<b>FHA</b>	Federal Housing Administration	<b>GOES</b>	Geostationary Operational Environmental Satellite
<b>FHWA</b>	Federal Highway Administration	<b>GOOS</b>	Global Ocean Observing System
<b>FM</b>	frequency modulation	<b>GOSIC</b>	Global Observing System Information Center
		<b>GPS</b>	global positioning system

<b>GRACE</b>	Gravity Recovery and Climate Experiment	<b>IPHE</b>	International Partnership for the Hydrogen Economy
<b>GRACEnet</b>	Greenhouse Gas Reduction through Agricultural Carbon Enhancement Network	<b>IPY</b>	International Polar Year
<b>GRP</b>	Grassland Reserve Program	<b>IRENA</b>	International Renewable Energy Agency
<b>GRUAN</b>	GCOS Reference Upper-Air Network	<b>IRG</b>	International Resources Group
<b>GTOS</b>	Global Terrestrial Observing System	<b>IRI</b>	International Research Institute for Climate and Society
<b>GWP</b>	global warming potential	<b>ISE</b>	Informal Science Education
<b>ha</b>	hectare	<b>ITAP</b>	International Technical Assistance Program
<b>HCFC</b>	hydrochlorofluorocarbon	<b>ITEST</b>	Innovative Technology Experiences for Students and Teachers
<b>HD</b>	high definition	<b>ITP</b>	Industrial Technologies Program
<b>HFC</b>	hydrofluorocarbon	<b>IWGEO</b>	Interagency Working Group on Earth Observations
<b>HFC-23</b>	fluoroform	<b>JAXA</b>	Japanese Exploration Space Agency
<b>HFEs</b>	hydrofluorinated ethers	<b>K-12</b>	kindergarten through grade 12
<b>HIV/AIDS</b>	human immunodeficiency virus/ acquired immunodeficiency syndrome	<b>kg</b>	kilogram
<b>HSPF</b>	Hydrologic Simulation Program–Fortran	<b>km</b>	kilometer
<b>HUD</b>	U.S. Department of Housing and Urban Development	<b>km<sup>2</sup></b>	square kilometers
<b>HVAC</b>	heating, ventilation, and air conditioning	<b>kWh</b>	kilowatt-hour
<b>IAC</b>	Industrial Assessment Center	<b>LDCM</b>	Landsat Data Continuity Mission
<b>IASI</b>	Infrared Atmospheric Sounding Interferometer	<b>LIDAR</b>	light detection and ranging
<b>ICAA</b>	Initiative for Conservation in the Andean Amazon	<b>LMOP</b>	Landfill Methane Outreach Program
<b>ICO</b>	Integration and Coordination Office	<b>M2M</b>	Methane to Markets
<b>ICS</b>	Incident Command System	<b>MCC</b>	Millennium Challenge Corporation
<b>IDEA</b>	Integrated Data and Environmental Applications	<b>MEF</b>	Major Economies Forum on Energy and Climate
<b>IEA</b>	International Energy Agency	<b>MERITO</b>	Multicultural Education for Resource Issues Threatening Oceans
<b>IGEM</b>	Intertemporal General Equilibrium Model	<b>MetOp</b>	Meteorological Operational
<b>IGLO</b>	International Action on Global Warming	<b>mi</b>	mile
<b>in</b>	inch	<b>mi<sup>2</sup></b>	square miles
<b>IOOS</b>	Integrated Ocean Observing System	<b>MIT</b>	Massachusetts Institute of Technology
<b>IPCC</b>	Intergovernmental Panel on Climate Change	<b>mm</b>	millimeter
		<b>MMT</b>	million metric tons
		<b>MMTCO<sub>2</sub></b>	million metric tons of carbon dioxide

<b>MODIS</b>	Moderate Resolution Imaging Spectroradiometer	<b>NPOESS</b>	National Polar-orbiting Operational Environmental Satellite System
<b>MOU</b>	Memorandum of Understanding	<b>NPS</b>	National Park Service
<b>MPL</b>	Micro Pulse Lidar	<b>NRC</b>	National Research Council
<b>MPLNET</b>	Micro Pulse Lidar Network	<b>NRCS</b>	Natural Resources Conservation Service
<b>MPG</b>	miles per gallon	<b>NSF</b>	U.S. National Science Foundation
<b>MPO</b>	metropolitan planning organization	<b>NSTA</b>	National Science Teachers Association
<b>MSM</b>	Multi-Scale Modeling	<b>NSDL</b>	National STEM Education Distributed Learning
<b>MSW</b>	municipal solid waste	<b>NSTC</b>	National Science and Technology Council
<b>MW</b>	megawatt	<b>NTI</b>	National Transit Institute
<b>MWe</b>	megawatts electric	<b>NWCC</b>	National Water and Climate Center
<b>MWh</b>	megawatt-hour	<b>O<sub>3</sub></b>	ozone
<b>MY</b>	model year	<b>OAP</b>	Office of Atmospheric Programs
<b>N<sub>2</sub>O</b>	nitrous oxide	<b>OAS</b>	Organization of American States
<b>NACP</b>	North American Carbon Program	<b>OCO</b>	Orbiting Carbon Observatory
<b>NAS</b>	National Academies of Science	<b>OCS</b>	Outer Continental Shelf
<b>NASA</b>	National Aeronautics and Space Administration	<b>ODS</b>	ozone-depleting substance
<b>NAST</b>	National Assessment Synthesis Team	<b>OECC</b>	White House Office of Energy and Climate Change
<b>NCDC</b>	National Clean Diesel Campaign	<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>NCDC</b>	National Climatic Data Center	<b>ONMS</b>	Office of National Marine Sanctuaries
<b>NEMS</b>	National Energy Modeling System	<b>OPEC</b>	Organization of the Petroleum Exporting Countries
<b>NEON</b>	National Ecological Observatory Network	<b>OPIC</b>	Overseas Private Investment Corporation
<b>NF<sub>3</sub></b>	nitrogen trifluoride	<b>OSTP</b>	Office of Science and Technology Policy
<b>NGO</b>	nongovernmental organization	<b>OSVW</b>	ocean surface vector winds
<b>NHTSA</b>	National Highway Traffic Safety Administration	<b>P2C2</b>	Paleo Perspectives on Climate Change
<b>NIDIS</b>	National Integrated Drought Information System	<b>PAA</b>	Price-Anderson Act
<b>NIFA</b>	National Institute of Food and Agriculture	<b>PaCIS</b>	Pacific Climate Information System
<b>NMVOG</b>	non-methane volatile organic compound	<b>PANGEA</b>	Partnerships for New GEOSS Applications
<b>NOAA</b>	National Oceanic and Atmospheric Administration	<b>PARTNER</b>	Partnership for Air Transportation Noise and Emissions Reduction
<b>NO<sub>x</sub></b>	oxides of nitrogen	<b>PES</b>	payment for ecosystem services
<b>NP</b>	nuclear power	<b>PFAN</b>	Private Financing Advisory Network

<b>PFC</b>	perfluorocarbon	<b>SAFETEA-LU</b>	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
<b>PHEV</b>	plug-in hybrid electric vehicle	<b>SAPs</b>	Synthesis and Assessment Products
<b>PIH</b>	plug-in hybrid	<b>SAR</b>	Second Assessment Report
<b>PL</b>	Public Law	<b>SCAN</b>	Soil Climate Analysis Network
<b>PM</b>	particulate matter	<b>S'COOL</b>	Students' Cloud Observations On-Line
<b>POES</b>	Polar Operational Environmental Satellites	<b>SeaWiFS</b>	Sea-viewing Wide Field-of-view Sensor
<b>PRICIP</b>	Pacific Region Integrated Climatology Information Products	<b>SEN</b>	Save Energy Now
<b>PTC</b>	production tax credit	<b>SEP</b>	State Energy Program
<b>QuickSCAT</b>	Quick Scatterometer	<b>SERVIR</b>	Regional Visualization and Monitoring System
<b>R&amp;D</b>	research and development	<b>SF<sub>6</sub></b>	sulfur hexafluoride
<b>RAMA</b>	Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction	<b>SFR</b>	Sodium Fast Reactor
<b>RANET</b>	Radio and Internet for the Communication of Hydro-Meteorological and Climate-Related Information for Development	<b>SGCR</b>	Subcommittee on Global Change Research
<b>RCMRD</b>	Regional Center for Mapping of Resources for Development	<b>SHADOZ</b>	Southern Hemisphere ADditional OZonesondes
<b>RD&amp;D</b>	research, development, and demonstration	<b>SNAP</b>	Significant New Alternatives Policy program
<b>REC</b>	renewable energy credit	<b>SNOTEL</b>	SNOpack TELEmetry
<b>REDD</b>	reducing emissions from deforestation and degradation	<b>SO<sub>2</sub></b>	sulfur dioxide
<b>REDI</b>	Renewables and Efficiency Deployment Initiative	<b>SOARS</b>	Significant Opportunities in Atmospheric Research and Science
<b>REEEP</b>	Renewable Energy and Energy Efficiency Partnership	<b>SORCE</b>	Solar Radiation and Climate Experiment
<b>REPI</b>	Renewable Energy Production Incentive	<b>SOS</b>	Science On a Sphere®
<b>RES</b>	renewable energy standard	<b>STAR</b>	Science To Achieve Results
<b>RFS</b>	renewable fuels standard	<b>STEM</b>	science, technology, engineering, and mathematics
<b>RGGI</b>	Regional Greenhouse Gas Initiative	<b>SUV</b>	sport utility vehicle
<b>RISA</b>	Regional Integrated Science and Assessments Program	<b>SWAT</b>	Soil and Water Assessment Tool
<b>RPS</b>	renewable portfolio standard	<b>SWiM</b>	System-Wide Monitoring
<b>S&amp;A</b>	synthesis and assessment	<b>T&amp;D</b>	transmission and distribution
		<b>TAO</b>	Tropical–Atmosphere–Ocean
		<b>TBtus</b>	trillion British thermal units
		<b>TFCA</b>	Tropical Forest Conservation Act
		<b>Tg</b>	teragram

<b>Tg CO<sub>2</sub> Eq.</b>	teragrams of carbon dioxide equivalents	<b>USDA</b>	U.S. Department of Agriculture
<b>TIGGER</b>	Transit Investment for Greenhouse Gas and Energy Reduction	<b>USDP</b>	U.S. Drought Portal
<b>TIST</b>	International Small Group and Tree Planting Program	<b>USFS</b>	U.S. Forest Service
<b>UBM</b>	Undergraduates in Biological and Mathematical Sciences	<b>USFWS</b>	U.S. Fish and Wildlife Service
<b>UN</b>	United Nations	<b>USGCRP</b>	U.S. Global Change Research Program
<b>UNEP</b>	United Nations Environment Programme	<b>USGEO</b>	U.S. Group on Earth Observation
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change	<b>USGS</b>	U.S. Geological Survey
<b>UNIFEM</b>	United Nations Development Fund for Women	<b>USTDA</b>	U.S. Trade and Development Agency
<b>UNPEPP</b>	University-National Park Energy Partnership Program	<b>VCOP</b>	Voluntary Code of Practice for the Reduction of Emissions of HFC & PFC Fire Protection Agents
<b>USAID</b>	U.S. Agency for International Development	<b>VHTR</b>	Very-High-Temperature Reactor
<b>USCRN</b>	U.S. Climate Reference Network	<b>WAP</b>	Weatherization Assistance Program
<b>US-CTC</b>	U.S. Climate Technology Cooperation	<b>WCI</b>	Western Climate Initiative
		<b>WHIP</b>	Wildlife Habitat Incentives Program
		<b>WMO</b>	World Meteorological Organization
		<b>WRP</b>	Wetland Reserve Program