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Inside

Global Warming: Frequently Asked Questions

By David Easterling and Tom Karl, National Climatic Data Center, Asheville, NC

This article is based on a brief synopsis of the 2007 Fourth Assessment Report (AR4) by the Intergovernmental Panel on Climate Change (IPCC), as well as National Climatic Data Center's (NCDC) data resources.

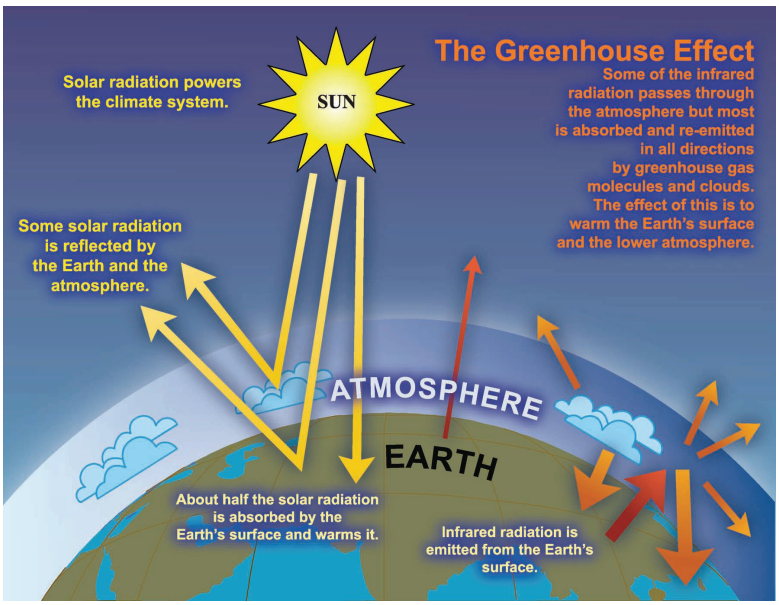
One of the most hotly debated topics on Earth is the issue of climate change, and the National Environmental Satellite, Data, and Information Service (NESDIS) data centers are central to answering some of the most pressing global change questions that remain unresolved.

NCDC contains the instrumental and paleoclimatic records that can precisely define the nature of climatic fluctuations at time scales of a century and longer. Among the diverse kinds of platforms whose data contribute to NCDC's resources are ships, buoys, weather stations, weather balloons, satellites, radar and many climate proxy records such as tree rings and ice cores.

The National Oceanographic Data Center contains the subsurface ocean data that reveal the ways heat is distributed and redistributed over the planet.

Knowing how these systems are changing and how they have changed in the past is crucial to understanding how they will change in the future. And, for climate information that extends from hundreds to thousands of years, paleoclimatology data, from NCDC helps to provide longer term perspectives.

Internationally, the Intergovernmental Panel on Climate Change (IPCC), under the auspices of the United Nations (UN), World Meteorological Organization (WMO), and the United Nations Environment Program (UNEP), is the most senior and authoritative body providing scientific advice to global policy makers. The IPCC met in full session in 1990, 1995, 2001 and in 2007. They address issues such as the buildup of greenhouse gases, evidence, attribution, and prediction of climate change, impacts of climate change, and policy options.



Listed on the next page are a number of questions commonly addressed to climate scientists, and brief replies (based on IPCC reports and other research) in what we hope is understandable language. This list will be periodically updated, as new scientific evidence comes to light.

Human activity has been increasing the concentration of greenhouse gases in the atmosphere (mostly carbon dioxide from combustion of coal, oil, and gas; plus a few other trace gases). There is no scientific debate on this point.

What is the greenhouse effect, and is it affecting our climate?

The greenhouse effect is unquestionably real and helps to regulate the temperature of our planet. It is essential for life on Earth and is one of Earth's natural processes.

The greenhouse effect is the result of heat absorption by certain gases in the atmosphere (called greenhouse gases because they effectively "trap" heat in the lower atmosphere) and re-radiate downward some of that heat. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide and other trace gases.

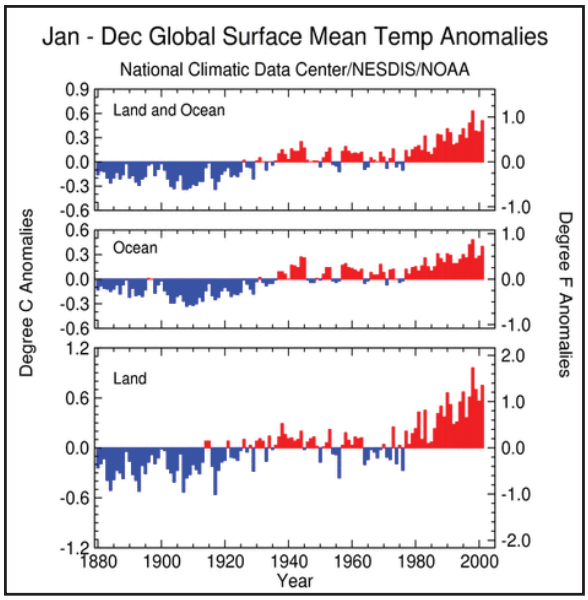
Without a natural greenhouse effect, the average temperature of the Earth would be about zero degrees F (-18°C) instead of its present 57°F (14°C). So, the concern is not with the fact that we have a greenhouse effect, but whether human activities are leading to an *enhancement* of the greenhouse effect by the emission of greenhouse gases through fossil fuel combustion and deforestation.

Are greenhouse gases increasing?

Human activity has been increasing the concentration of greenhouse gases in the atmosphere, mostly carbon dioxide from combustion of coal, oil, and gas; plus a few other trace gases. There is no scientific debate on this point. Pre-industrial levels of carbon dioxide, before the start of the Industrial Revolution, were about 280 parts per million by volume (ppmv); current levels are about 380 ppmv. The global concentration of CO_2 in our atmosphere today far exceeds the natural range over the past 650,000 years or 180 to 300 ppmv. According to the IPCC Special Report on Emission Scenarios (SRES), by the end of the 21st century, we could expect to see carbon dioxide concentrations of anywhere from 490 to 1260 ppm, 75%-350% above the pre-industrial concentration.

Is the climate warming?

Global surface temperatures have increased about 0.74°C (plus or minus 0.18°C) since the late-19th century. The linear trend for the past 50 years of 0.13°C (plus or minus 0.03°C) per decade is nearly twice that for the past 100 years. The warming has not been globally uniform. Some areas (including parts of the southeastern U.S. and parts of the North Atlantic) have, in fact, cooled slightly over the past century. The recent warmth has been greatest over North America and Eurasia between 40 and 70°N. Lastly, seven of the eight warmest years on record have occurred since 2001; the 10 warmest years have all occurred since 1995.



Recent analyses of temperature trends in the lower and mid- troposphere (between about 2,500 ft. and 26,000 ft.) using both satellite and radiosonde (weather balloon) data show warming rates that are similar to those observed for surface air temperatures . These warming rates are consistent with their uncertainties and these analyses reconcile a discrepancy between warming rates noted on the IPCC Third Assessment Report (see the U.S. Climate Change Science Plan Synthesis and Assessment Report 1.1).

An enhanced greenhouse effect is expected to cause cooling in higher parts of the atmosphere because the increased "blanketing" effect in the lower atmosphere holds in more heat, allowing less to reach the upper atmosphere.

Cooling of the lower stratosphere (about 49,000 ft.-79,500 ft.) since 1979 is shown by both satellite Microwave Sounding Unit and radiosonde data (see previous figure), but is larger in the radiosonde data, likely due to uncorrected errors in that data.

Relatively cool surface and tropospheric temperatures, and a relatively warmer lower stratosphere, were observed in 1992 and 1993, following the 1991 eruption of Mt. Pinatubo. The warming reappeared in 1994. A dramatic global warming, at least partly associated with the record El Niño, took place in 1998. This warming episode is reflected from the surface to the top of the troposphere.

There has been a general, but not global, tendency toward reduced diurnal temperature range (DTR: the difference between daily high or maximum and daily low or minimum temperatures) over about 70% of the global land mass since the middle of the 20th century. However, for the period 1979-2005, the DTR shows no trend since the trend in both maximum and minimum temperatures for the same period are virtually identical, both showing a strong warming signal.

A variety of factors likely contribute to this change in DTR, particularly on a regional and local basis, including changes in cloud cover, atmospheric water vapor, land use and urban effects.

Indirect indicators of warming such as borehole temperatures, snow cover, and glacier recession data, are in substantial agreement with the more direct indicators of recent warmth. Evidence such as changes in glacial mass balance (the amount of snow and ice contained in a glacier) is useful since it not only provides qualitative support for existing meteorological data, but glaciers often exist in places too remote to support meteorological stations. The records of glacial advance and retreat often extend back further than weather station records, and glaciers are usually at much higher altitudes than weather stations, allowing more insight into temperature changes higher in the atmosphere.

Large-scale measurements of sea-ice have only been possible since the satellite era, but through looking at a number of different satellite estimates, scientists have determined that September Arctic sea ice has decreased between 1973 and 2007 at a rate of about -10% +/- 0.3%/decade.

Look for more on global warming in the Spring edition of the *National Cooperative Observer*. ❄

The Great Hail Storm of 1819

The story below is an account of a severe hail storm on June 9, 1819, in northeastern Vermont. It was contributed by Ray Helenek.

About 4 o'clock on the afternoon of Wednesday the 9th, in an instant, the towns of Wheelock, Sheffield, Sutton and Burke were visited with a hail storm, which for violence and the bigness of the hail, it is presumed, will find no parallel since the settlement of New England.

The common size of the hail stones are stated to have been that of a hen's egg; while some were even larger, but of pronged, irregular shape. Much damage was done in its course to forest and other trees, and many broken off or torn up by the roots.

The roofs of houses were materially injured by the hail stones; and in the town of Sutton only, it is computed that more than 1,000 squares of glass were broken (in the meeting house 132) and indeed all that came in contact with the storm.

An athletic young man, 23 years of age, who was overtaken by the tempest while chopping in the woods, was knocked down twice by the force of the hail when retreating to the house for shelter. In one instance, a stone struck him in the head, prostrated him to the earth, and produced a swelling, by the time he had reached the house, nearly an inch in thickness.

Others caught out, were badly bruised by the "merciless pelting of the storm," and one woman had, not her head, but hair comb broken. A pig, 5 or 6 weeks old, and several lambs, hens, etc., were killed by the hail stones; and many even penetrated through the roofs of barns. The storm was of short duration, and its breadth about 1 mile.

We have sometimes had our credulity shaken on the perusal of such extraordinary occurrences which took place at a distance, but we feel authorized to avouch for the validity of the above statement, having received the sketch from a gentleman of undoubted veracity, who was eye witness to the scene. ❄

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Thomas Jefferson Award Winners

From left Meteorologist-in-Charge (MIC) Thomas Niziol, NWS Buffalo, NY, presents the Thomas Jefferson Award to Co-recipients Thelma and Ron Hudson for their exceptional support of the NWS Cooperative Observer program. Also pictured is David Thomas, Meteorologist Intern. Thelma and Ron live near Wales, NY.

Richard A. Feser, Cooperative Weather Observer from Springfield, MN, was honored with the Thomas Jefferson Award at a November 2007 ceremony. Richard has served as the official Springfield Observer for over 43 years and has gone above and beyond the call of duty numerous times to report local weather and river conditions.

At his award luncheon, four Springfield citizens spoke about Richard with the highest regard, using words such as “dedicated,” “reliable” and “committed.” Pete Boulay, Minnesota Assistant State Climatologist, spoke of how Richard’s unbroken and highly accurate record of weather conditions has benefited his local community and others at the state and national level. Dan Luna, MIC, at NWS Chanhassen, MN, presented letters of appreciation from Minnesota’s U.S. Senators, the local U.S. Representative, and Minnesota Governor Tim Pawlenty.

From left NWS OPL Michelle Margraf, Central Region Deputy Regional Director John Ogren, MIC Dan Luna, Jefferson Award Winner **Richard Feser**, Richard's wife Gladys Feser and Minnesota Assistant State Climatologist Pete Boulay. Photo by Doris Weber.

Central Region Deputy Regional Director John Ogren presented the Jefferson Award to Richard. John noted that Richard’s, “got Thomas Jefferson beat by 3 years of service!” Michelle Margraf, NWS Observing Program Leader (OPL), nominated Richard for the award. She told the gathering of Richard’s friends and family that he has been interested in weather since he was 5 years old. Richard has taken over 15,800 weather observations in Springfield. Richard, 76 years old, says he’s maybe “half done” with his weather observing.

Richard often goes above and beyond to help keep people safe from the extreme weather in the Springfield area. He’s done everything from using his rifle to shoot benchmarks along the river when it was at record flood levels, sandbagging during a blizzard, recording temperatures between -32 and 105 degrees, and calling in damage from severe storms to help local officials. Richard truly shares Thomas Jefferson’s passion for weather.

John Campanius Holm Award Winners

Jerald and Bonnie Bergman, Cooperative Observers at the East Montana Agriculture Branch Experiment Station in Sidney, MT, received a John Campanius Holm Award from NWS Glasgow, MT, MIC Steven Apfel; and OPL Matthew Moorman.

Pictured from left are NWS Glasgow, MT, MIC Steve Apfel and Holm Award Winners **Jerald and Bonnie Bergman**.

Alvin Brensing of Hudson, KS, was presented the John Campanius Holm Award by Larry Ruthi, MIC, Dodge City, KS, at the Stafford County Flour Mill. Alvin, 90, began taking observations in 1982. He is currently the president of the Stafford County Flour Mill, where he has worked since 1937.

Also in attendance for the ceremony were Debbie Pugh, Dodge City, District Representative from U.S. Senator Pat Roberts's office; Mike Zamrzla, Hutchinson, District Representative from U.S. Representative Jerry Moran's office; NWS Dodge City Meteorologists Jamie Bielinski and Mike Lacy; CPM Duane Wolfe; and OPL Jesse Lee.

Pictured from left are Jesse Lee, OPL, NWS Dodge City, KS; **Alvin Brensing,** award winner; and Larry Ruthi, MIC Dodge City KS. Photo by Jamie Bielinski, Lead Forecaster Dodge City, KS.

John Campanius Holm Award Winners

John Duckworth was presented with the John Companius Holm Award and a 40 Year Length of Service Award at his home in Wallowa, OR. John started taking observations by helping his mother when she started 40 years ago.

Presenting the award is Dennis Hull, WCM at NWS Pendleton, OR. Also on hand were OPL Jim Zdrojewski, HMT Ann Adams and HMT Jim Smith.

From left, Dennis Hull, WCM at NWS Pendleton, OR, and Holm Award winner **John Duckworth.**

Pictured from left are Gary Beeler, NWS Mobile, AL; **Sidney J. "Billy" Hardy, Jr.;** and County Emergency Management Agency Director Joyce Williams.

Sidney J. "Billy" Hardy, Jr., of Alberta, AL, is a recipient of the NWS John Campanius Holm Award. Sidney became the first official Cooperative Weather Observer in the Alberta area in 1940. He turned the observing duties over to his father in February 1942 when he enlisted in the Army Air Corps. He returned to being the full time Cooperative Observer on January 1, 1977, and continues to this day, having provided over 30 years of continuous observations. Everyone in the area knows Billy and defers to his precipitation observations as the official ones for the region.

John Campanius Holm Award Winners

NWS recognized more than 34 years of dedication by Dubois, ID, resident **Tom Kellom** and by Oakley, ID, residents **Mike and Sherryl Whittle** by naming them recipients of the John Campanius Holm Award. The Award is presented for outstanding service in the Cooperative Observer program.

Tom began recording weather observations at Dubois in 1973. During his tenure, Tom provided uninterrupted weather observations and recorded daily precipitation and temperature data, as well as critical storm spotter information. Tom's site was the first location to send weather observations electronically via the Internet. His flawless and informative observations have been instrumental in providing the NWS with critical weather information.

The Whittle family history of weather observations began in 1949. From the beginning, it has been a family responsibility. Mike and Sherryl continue the family tradition. They have been taking uninterrupted weather observations since 1973. From their home, they have observed and reported numerous significant weather events to the National Weather Service.

Pictured from left are David Brandon, Chief of Hydrology, NWS Western Region Headquarters; **Mike and Sherryl Whittle**, joint award winners; Gary Wicklund, OPL; **Tom Kellom**, award winner; and Rick Dittmann, MIC, NWS Pocatello, ID. Photo by Vernon Preston, WCM, NWS Pocatello.

Anton Haner, right, Cooperative Observer at Tarpley, TX, received the John Campanius Holm Award for his many years of outstanding service to the National Weather Service in Texas. The award was presented by Joe Arellano Jr, MIC, San Antonio, TX.

John Campanius Holm Award Winners

Dee and Phyllis Scherich of rural Wilmore, KS, were awarded the John Campanius Holm Award by Larry Ruthi, MIC, Dodge City, KS. The award was presented at a memorial park in Coldwater, KS. Also in attendance for the ceremony were Debbie Pugh, Dodge City, District Representative from U.S. Senator Pat Roberts's office; Mike Zamrzla, Hutchinson, District Representative from U.S. Representative Jerry Moran's office; Meteorologists Jamie Bielinski and Mike Lacy, NWS Dodge City; Duane Wolfe, CPM; and Jesse Lee, OPL.

Pictured from left are Jesse Lee, OPL, Dodge City, KS; **Dee and Phyllis Scherich,** Holm Award winners; and Larry Ruthi, MIC. Photo by Jamie Bielinski, Lead Forecaster.

Thomas Niziol, MIC, NWS Buffalo, NY, Forecast Office, presented **Gerald Morczek**, with the John Campanius Holm Award. Gerald has been an outstanding Cooperative Observer at the Highmarket weather station. He has demonstrated an impressively strong commitment to the NWS program.

John Campanius Holm Award Winner

A John Campanius Holm Award was presented to Slade, KY, Observer **Eula Skidmore**. Pictured from left are NWS Jackson, KY, HMT Bonnie Terrizzi; WCM Tom Johnstone; OPL David Stamper (back); **Eula Skidmore**, Award winner; SOO Gary Votaw; Administrative Support Assistant Tabitha Brewer; Metoeorologist Chuck Grief (back) and MIC Shawn Harley.

Special Act Award

Bob Trudo, retiring manager of the **Detour Village Water Plant**, shows his NWS Special Act Award presented for his 19 years of faithfully recording cooperative observations. Bob is also being recognized for his care and feeding of both a Fischer-Porter and an Fischer-Porter Upgrade at this remote and lovely area at the far eastern end of Michigan's Upper peninsula. The award was presented by Dennis R. Fruehauf, CPM, NWS Gaylord, MI.

115 Year Family Heritage Award

From left with Opie, the dog, are Steve Buan, HPM, NWS Chanhassen, MN; Deb Hanson, Substitute Weather Observer; Pete Boulay, Minnesota DNR Assistant State Climatologist; Craig Edwards, Retired MIC; and **Martha and Luther Opjorden**, Milan Observers. Photo courtesy of the *Milan Standard Watson Journal.*

Luther and Martha Opjorden of Milan, MN, were presented with the NWS Family Heritage Award. The award honored their family for taking daily weather observations on their farm without interruption for the past 115 years.

The family legacy began in 1893 when **O.K. Opjorden** started taking observations at his Milan farm. He continued for 28 years before passing on the duty to his daughter, **Ragna Opjorden**, in October of 1921. Her brother, **Torfinn Opjorden**, took over observing in January 1925. Some 57 years later in 1982, Torfinn turned the weather station over to his son, **Luther Opjorden**. He and his wife, **Martha**, have continued to take observations on the family farm for the past 26 years. To ensure no observations are missed, Luther and Martha have had their friend, Deb Hanson, fill in while the family is on vacation.

The Family Heritage Award is not the first award the family has received for their exceptional service. Torfinn received the John Companius Holm Award for outstanding accomplishments in the field of meteorological observations. This award is given to only 25 observers per year. In 1975, Torfinn was also honored with the most prestigious national award for a Cooperative Weather Observer, the Thomas Jefferson Award, given to only 5 observers a year nationwide.

NWS owes a debt of gratitude to the Opjorden family for their remarkable commitment to maintaining weather records. The nearly unprecedented 115 year record of climate data is a treasured part of the United States' weather data collection. The value of the climate data their family continues to provide will be priceless to researchers for years to come.

100 Year Family Heritage Award

From left: **Donna and Hal Cromley** show their Family Heritage Award certificate; Charleston, SC, MIC Mike Emlaw and **Chap Cromley** look on. Photo by OPL Vern Beaver.

Charleston, SC, MIC Mike Emlaw and OPL Vern Beaver presented **Hal and Chap Cromley** with the Cooperative Observer Family Heritage Award for the family's 100+ years of service. Members of the Cromley family have served as Cooperative Observers and provided daily weather reports since 1907 at Brooklet, GA. The unbroken record of climatological readings for Brooklet was started by great-grandfather **John C. Cromley** in August 1907. John was followed by his son William C. Cromley, Sr., in 1910. In 1964, Hal's dad, **William C. Cromley, Jr.,** took over. **Hal** and **Chap Cromley** assumed the family commitment in 1991. During the award presentation, letters of appreciation from the Director of the National Weather Service and from Eastern Region Director Dean Gulezian were given to Hal and Chap.

75 Year Honored Institution Award

From left, **Rob Ellis** of Greeneville Experimental Station, TN, accepts an Honored Institution Award for 75 years of service during an open house at NWS Morristown, TN. The award was presented by HMT Derek Eisentrout. OPL Craig Carpenter and MIC George Mathews also attended. Greeneville Cooperative records date to January 1887 with the current location reporting since 1932. Greeneville is associated with the University of Tennessee (UT). Rob, in his UT orange, was on the way to a football game, but took the time to attend our Open House and accept this award. Photo taken by Greg Kyle, courtesy of *The Morristown Citizen Tribune.*

50 Year Honored Institution Awards

John Bird, Division Chief of the **Anacortes Fire Department**, Anacortes WA, accepts a 50 Year Honored Institution Award for the department. The presentation was made by NWS Seattle OPL Arthur Gaebel.

Staff at **Brookgreen Gardens**, SC, accept a 50 Year Honored Institution Award. Brookgreen Gardens was opened in 1931 as America's first public sculpture garden. Its placement in more than 50 acres of landscaped grounds creates an extraordinarily beautiful combination of art and nature. The collection now contains over 1,200 works of art spanning the entire period of American sculpture from the early 1800s to the present.

From left are Brookgreen Garden staff member **Gene Funderburk, Mike Ammons, Grudon Tarbox**, NWS Wilmington, NC, MIC Michael Caropolo, and **Bob Jewell**.

50 Year Honored Institution Awards

Wayne Davis, Plant Manager of the **Lawrenceburg Filter Plant**, accepts a 50 Year Honored Institution Award. The plant is part of the Lawrenceburg, TN, Utility System. Ralph Troutman OPL, NWS Nashville, TN, presented the award. The site was one of the first to convert to the Fischer-Porter Upgrade.The plant operators are also involved in watching and reporting conditions on Lawrenceburg's Shoal Creek, a stream very prone to flash floods.

Staff at the **University Police Department at California Polytechnic State University** in San Luis Obispo, CA, accepts a 50 Year Institutional Award. This award was presented by Dessa Emch, OPL and Bonnie Bartling HMT, NWS Los Angeles, CA. Photo by Cheryl Andrus, University Police Department

From left back: **Suzi Goodwin** and **Michael Beaubien**. Back Right: **Cindy Campbell Wayne Lyons**. **Front: Rebecca Adams, Kelly Steveson, Marlene Cramer, John Edds, Fred Mills,** Bonnie Bartling, NWS, and **Susan Rains.**

50 Year Honored Institution Awards

A 50 year Honored Institution Award was presented to the city of **John Day, OR**. Observations are taken by the Department of Public Works. On hand for the award from left were **John Robinson, Ken Stevens, John Logan, David Holland, Dan Larman,** and **Monte Legg.** Team member Fred Ostberg is not pictured. Everyone is involved in helping with the observations. The award was presented by NWS Pendleton OPL Jim Zdrojewski.

45 Year Length of Service Award

From left, **Tim Crews** and **Ed Dodson** of **Morristown Radio WCRK, TN**, accept a 45 year Length of Service Award during an open house at NWS Morristown. Ed is the station's General Manager and has been taking observations at WCRK since 1961. The award was presented by NWS Morristown HMT Derek Eisentrout. Also attending were Craig Carpenter, OPL, and George Mathews, MIC. Photo by Greg Kyle, courtesy of *The Morristown Citizen Tribune*.

40 and 30 Year Length of Service Awards

Ramona Bowen accepts 40 Year Length of Service Award for her observations at Whitesburg, KY. Presenting the award was Tom Johnstone, WCM, NWS Jackson KY. Ramona and her husband Philmore, (deceased 2002) have been observing from this site since 1966. Photo by OPL David Stamper.

John Klose represented his family, who are observers at Bertram, TX. John shows the family's 40 Year Family Length of Service Award. The award was presented by Patrick Mcdonald, HMT, San Antonio, TX.

From left, Mr. and Mrs. Tom Westfall show their 30 Year Length of Service Award presented by Shawn Harley, MIC, and Gary Votaw, SOO, from NWS Jackson, KY. Tom and his family have taken observations from Ivel, KY, for over 36 years. Photo by OPL David Stamper.

30 Year Length of Service Awards

Anna Belle Walker of Pep, TX, accepts her 30 Year Award from Lubbock, TX, MIC Justin Weaver. Besides being a rainfall observer, Anna Belle was also the postmaster at Pep for about 34 years. As you can see in the background, she was ready to celebrate the holidays with her 3 children, 9 grandchildren, and 10 great grandchildren. She cooks for everyone each year for Thanksgiving and Christmas and shows no signs of slowing down. Photo by OPL Jerry English.

Mr. and Mrs. John Czerwonka of Rosholt, WI, show their 30 Year Length of Service Award presented by Meteorologist Intern (MIT) Steven Fleegel and OPL Pat Hein, NWS Green Bay, WI. John recently retired as postmaster of Nelsonville, WI, but is staying active with his tree farm. John was awarded the Wisconsin tree farmer of the year in 2003.

Conrad Banda, left, Observer at Pearsall, TX, received a 30 Year Length of Service Award from Joe Baskin, HMT, San Antonio, TX.

25 Year Length of Service Awards

Holly Cogan shows her 25 Year Service Award for Cooperative observing. Holly and husband Harry are long-time residents of the the Irish Hills region of southern Michigan. Holly and Harry celebrated their 40th wedding anniversary this spring. The town of Brooklyn, MI, is the furthest Cooperative site from the Grand Rapids office. It serves a vital purpose backing up the Jackson, MI, airport by providing rainfall totals for the nearby speedway. The award was presented by Grand Rapids OPL George Wetzel.

Laverne Bidelman, Cooperative Observer at Whitefish Point, MI, is shown receiving his 25 Year Length of Service Award. The Award was presented by Denny Fruehauf, CPM, NWS Gaylord, MI.

Teresa Espen received a 25 Year Length of Service Award from NWS Seattle, WA, OPL Arthur W. Gaebel. Teresa is the Cooperative Observer in Toledo, WA.

Gary and Olivia Zimmer receive a 25 Year Length of Service Award. They share duties as Observers for the Lefebvre Boy Scout Camp south of Laona, WI. Gary took over for this father, Emil, thus carrying on a fine family tradition.

25 Year Length of Service and Honored Institution Awards

NWS Jacksonville, FL, presented a 25 Year Honored Institution Award to the staff of the **Stephen C. Foster State Park**, in the heart of the Okefenokee Swamp. Pictured from left are **Marilyn Hart, Kathy Griffis, Mitchell Hendrix** and **Beth Howell**. The award was presented by Mike McAllister, OPL, and Amos Walker, HMT. A cold front had passed through earlier in the day and there were no alligators available for the photo opportunity.

Elizabth "Liz" Lindig, Observer at Johnson City, TX, shows her 25 Year Length of Service Award. The award was presented by Patrick Mcdonald, HMT, NWS San Antonio, TX.

20 Year Length of Service Awards

Taylor Davis, Observer in Crested Butte, CO, shows his 20 Year Length of Service Award presented by Becky Klenk, CPM, NWS, Grand Junction, CO.

W.F. and **Paula Greenway** of McCracken, KS, were awarded a 20 Year Length of Service Award by Jesse Lee, OPL, Dodge City, KS.

20 Year and 15 Year Length of Service Awards

Gene T. Jenkins, Observer at Bolton, GA, shows his 20 Year Length of Service Award. The award was presented by Nate Mayes, NWS Atlanta, GA.

Dan Massee, Observer at Ovando, MT, holds up his 20 Year Length of Service Award on a very mild Montana winter day. Stan Krenz, NWS Missoula, presented the award.

Mr. and Mrs. Kerry Lambert received a 15 Year Length of Service award for their observations at Kamas, UT. The award was presented by Steve Summy, OPL, WFO Salt Lake City. No photo available.

Richard Robinson of Drummond, MT, received a 20 Year Length of Service Award from Stan Krenz, NWS Missoula, MT. Richard has assisted his wife Cheryl in taking river stage readings on the Clark Fork River at Drummond since April 1987. The stage readings are obtained using a wire weight gage.

Elsie Hesterlee of Morton, TX, shows her 15 Year Award. We could not get her loyal dog, Beau, to get up in the chair with her; he was too interested in everything else going on. Elsie also volunteers at the senior citizen's center in town and gardens in her "spare" time. Photo taken by OPL Jerry English of NWS Lubbock, TX

15 and 10 Year Length of Service Awards

DAPM Terry Benthall presented a 15 Year Length of Service Award to **John Peeler** at his home near Mocksville, NC. After college, John worked for the U.S. Forestry Service in Alaska where he met his wife. When he returned home to North Carolina, he took over the family farm and began his weather career as a Cooperative Observer.

A 15 Year Length of Service award was presented to **Matthew Lindon**, Observer at Snyderville, UT. The award was presented by Brian McInerney, Senior Service Hydrologist, NWS Salt Lake City, UT.

Carol Hirsch, Cooperative Observer at Pierce City, MO, holds her 10 Year Length of Service Award presented by OPL Larry Dooley.

Mark Jenkins, Cooperative Observer at Danielsville, GA, receives his 10 Year Length of Service Award from Frank Taylor, NWS Atlanta, GA. Photo courtesy Nate Mayes, NWS Atlanta.

Ron Dellinger, Observer for the Howard, KS, area was presented a 10 Year Length of Service Award by Leon Wasinger, CPM, NWS Wichita, KS. Ron provides precipitation and temperature readings.

10 Year Length of Service Awards

Clinton Bowman from Denver City, TX, proudly displays his 10 Year Award, pin and date book. A retired newspaper man, Clinton is very community oriented and did not hesitate to accept our invitation to become an Observer 10 years ago. The award was presented by OPL Jerry English of Lubbock, TX.

Observer **Anne Wilson** was presented a 10 Year Length of Service Award for the Elmdale, KS, area. The award was presented by Michael "Joe" Rosner, DAPM, NWS Wichita, KS.

Ann Nell Smith proudly displays her 10 year Length of Service Award for her observations at Dumont, TX. Ann is a precipitation Observer with a Fischer-Porter gage and a standard 8 inch gage on the property. Measuring points are hard to find in this area of Texas so we are fortunate to have Ann. The award was presented by Jerry English, OPL, NWS Lubbock, TX.

Richard Herold Kitchens displays his 10 Year Award for observations at Childress, TX. When the ASOS was installed at the airport near Childress, it was decided that a Cooperative Observer was still needed. We were fortunate that Richard was willing to provide a much needed community and national service. If he gets under the weather a little, his son, Byron, pitches in. The presentation was made by Jerry English, OPL, NWS Lubbock, TX.

Observer **Tom Stevenson** was presented a 10 Year Length of Service Award for the Chanute, KS, area. Presenting the award was Leon Wasinger, CPM, NWS Wichita, KS.

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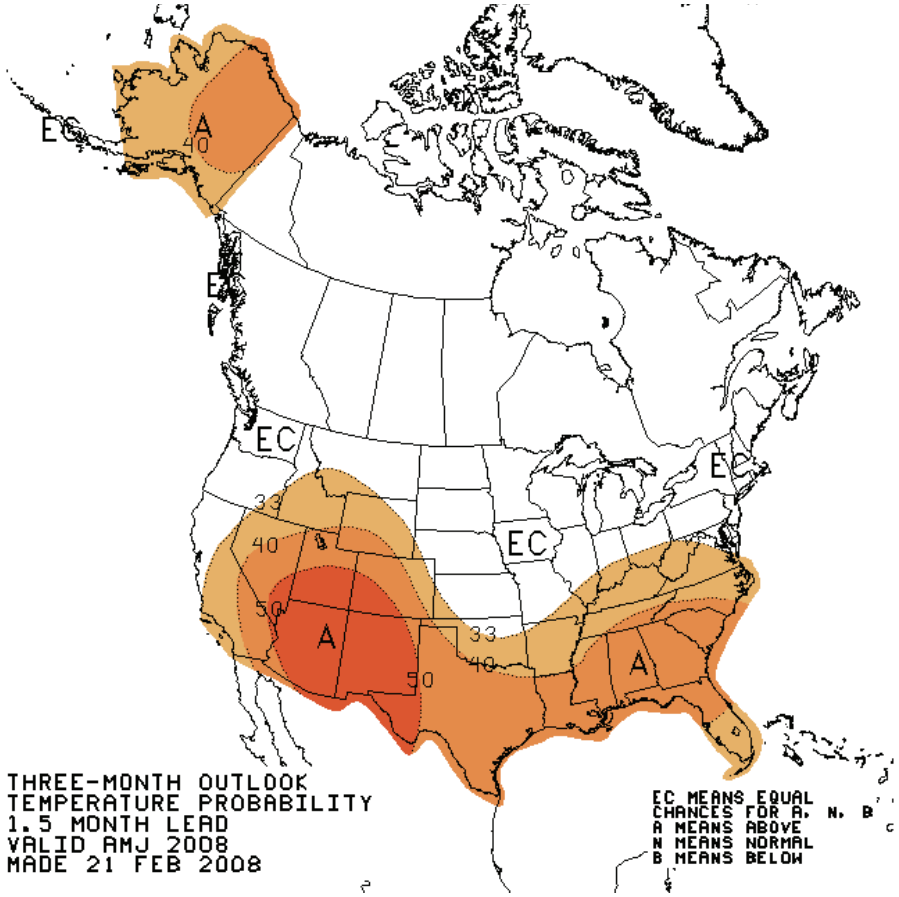
April, May, June Temperature Outlook From the Climate Prediction Center



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