

SPRING 1990

VOLUME 14, ISSUE 1

The State Climatologist

TOM KARL NAMED CHIEF, GCL

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Dr. Kenneth D. Hadeen, Director of NCDC, has recently announced the selection of Thomas R. Karl as Chief of the Global Climate Laboratory.

In 1987, he received the Department of Commerce's Bronze Medal for developing statistical techniques for interpreting climate data and contributing to the understanding of climate variability and its risks. In 1988, he received the Editors Award from the *Journal of Climate and Applied Meteorology* for outstanding reviews of papers submitted to the journal. He served as an Associate Editor of the American Meteorological Society's *Journal of Climatology* in 1988, and is the World Meteorological Organization's Rapporteur for Climatological Time Series for North and Central America. Currently, he is a lead author of the Climate Change and Variability Chapter of the World Meteorological Organization/United Nations Environmental Programme's Intergovernmental Panel on Climate Change, and the US/Soviet bilateral monograph *Climate Change*. He serves on the National Academy of Science's Effects Panel for the Policy Implications of Greenhouse Warming. In 1989, he received the NOAA Administrator's Award for significant leadership and skill leading to NOAA's ability to

Tom received training in meteorology from the University of Wisconsin (M.S. 1974) and from Northern Illinois University (B.S. 1973). He worked briefly as a weather forecaster with the University of Wisconsin and Weather Central in Madison, Wisconsin. In 1975, he joined the National Oceanic and Atmospheric Administration as a research meteorologist with Air Resources Laboratory in Research Triangle Park, North Carolina. In 1979, he spent nine months as a forecaster in the Weather Service Forecast Office in Anchorage, Alaska, before returning to North Carolina at the NCDC. In 1986, he also became an adjunct instructor in the Mathematics Department at the University of North Carolina at Asheville, and has taught in the Department of Atmospheric Sciences as well. Tom has been actively working in the area of climate variability over the past decade.

Dr. Kenneth Hadeen
Director, NCDC

Dr. Kelly Redmond
President, AASC

Steve Doty
Editor, The State Climatologist

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE

NATIONAL CLIMATIC DATA CENTER IN COOPERATION WITH
AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS

document, detect, and understand climate change. He has published 35 peer reviewed scientific journals and conference papers, and has recently co-authored a textbook on drought. He is a member of the American Geophysical Union and is chairman of the Committee for Applied Climatology of the American Meteorological Society.

Center includes the National Severe Storms Laboratory, the Oklahoma City National Weather Center Forecast Office, the NEXRAD Operational Support Facility, OU's School of Meteorology, the Cooperative Institute for Mesoscale Meteorological Studies, and the Oklahoma Climatological Survey.

Crawford brings 27 years experience...

New State Climatologist for Oklahoma

One of the top weather forecasters in the country has joined the faculty of the University of Oklahoma's School of Meteorology, one of the top weather programs in the country, Oklahoma University officials said.

Crawford brings 27 years of experience into the OU classroom, where he will teach undergraduate and graduate courses and guide graduate students in pursuing advanced degrees in climatology and meteorology. Crawford also wants to develop courses in hydrometeorology.

Kenneth C. Crawford, the Oklahoma area manager of the National Weather Service who directs what is considered the premier forecast office in the nation, became an Associate Professor of Meteorology and Director of the Oklahoma Climatological Survey, effective December 1.

And, as Director of the Climatological Survey and State Climatologist, he will develop research programs in climatology and their application in meteorology, hydrology, and agriculture. In addition, he will direct an expanding role in climatological services to education, industry and people in Oklahoma and the United States that includes data collection, archival services, dissemination, and interpretation.

Crawford would like to transform the entire state into a weather and climate laboratory...

"We are extremely pleased that Ken has made the decision to join Oklahoma University," said James F. "Jeff" Kimpel, Dean of the OU College of Geosciences, which includes the School of Meteorology,

It is in his role as Director of the Climatological Survey that Crawford would like to transform the entire state into a weather and climate laboratory in which automated agricultural, hydrological and meteorological instruments would be placed at 107 sites throughout the state. These instruments would report data in "real-time" to a Department of Public Safety communication system.

"He brings an extensive background, talent and knowledge of the Weather Center and its potential within the state and as a national resource to this country," Kimpel said. "In fact, we consider Ken a national resource."

This huge network, to be called Oklahoma MesoNet, would be developed between the College of Geosciences at OU and the College of Agriculture at Oklahoma State University. A proposal is pending

The Weather Center is a partnership of state and federal programs located on OU's main and north campuses. The Weather

*Results of GEA
have been
excellent*

to fund the project that, if approved, would benefit meteorology at OU, agriculture at OSU, and hydrology at both institutions. Crawford stated that MesoNet could be used in many ways. For example, OSU researchers could apply their crop, pesticide, and irrigation models for daily use in advising Oklahoma farmers on how to use such resources as groundwater, fertilizer, and pesticides. According to Crawford, the cost benefit to Oklahoma farmers of using MesoNet data is projected to be \$20 million a year.

Other MesoNet applications include using data to develop new industries such as ground source heat pumps. State utility industries could use the data to determine the optimum balance between user demands and excessive generation of electricity.

"Ken's existing contacts statewide in all 77 counties will be extremely useful in building up the reputation of the Climatological Survey and in building new graduate research initiatives," said Claude Duchon, Director of the OU School of Meteorology.

Crawford, Duchon, and Kimpel met more than 25 years ago at the University of Texas. Crawford and Kimpel were students, and Duchon was an instructor in meteorology. Crawford received his Bachelor's Degree in Engineering Science at UT, a Master's Degree in Meteorology from Florida State University, and his Doctoral Degree in Meteorology from OU.

Crawford is the author of some 20 articles that span several disciplines in meteorology. A Fellow in the American Meteorological Society, he is the recipient of NOAA's

Administrator's Award and of a Silver Medal from the Department of Commerce.

Extracted from an
OU Press Release

Cooperative Quality Control Continued

The Geographical Edit and Analysis (GEA) system has completed three months of parallel testing with the Western Region QC efforts. Results have been excellent with differences in the final resolution of MaxTemp AM shifters, the only notable difference.

An enhanced version of the Areal Edit module is uncovering more subtle data errors (thanks largely to the positive impact of double keying and some excellent advice from Kelly Redmond and Nolan Doesken). Emphasis has recently shifted (pardon the pun) to the automatic detection and correction of "shifters." These stations, numbering perhaps as much as 20% of all AM readers, incorrectly record the max (and sometime the min as well) on the previous day. Some may, in fact, actually be observing in the PM.

A multi-pronged effort, involving a "smart software" approach and observer education, is underway in an attempt to better reconcile this problem area.

GEA enhancements, aimed at improving validator interaction, are nearing completion and conversion to the full graphics/GIS PC platform is progressing on schedule.

Tom Reek
NCDC

Duties and Experiences of a Cooperative Observer
(read by the author at the Tennessee Weather Service Session of the American Society Meeting at Nashville, Tennessee, December 20, 1927)

For years it has been my desire to have a convention of the weather observers of our state, that I might meet my fellow cooperatives and exchange experiences with them, but such a convention up to this

and to his inferiors as Marse Bob, was one of the earliest observers in the state. In his early twenties, he began keeping a diary, a habit he continued the remaining fifty years of his life. Of course the weather furnished as ready a topic for written as for spoken thought and from weather notes in his diary, it was just a step to the daily record of a cooperative observer, which he first undertook to make for the Weather Bureau in 1883, 13 years after the organization of the

These instruments

are a part of my family and as dear to me as some cherished heirloom to another.

time has not seemed feasible.

But now two mighty luminaries in the scientific world are in conjunction and with their combined attractive force, are drawing all the earth, great and small, toward them. The American Meteorological Society, for the first time in its history, and the American Association for the Advancement of Science, for the second time in its history, are met in our capital city. Truly opportunity is at the high tide of the spring tide and my erstwhile dream, for years of too little importance to warrant fulfillment, is now a reality.

Weather Bureau as a division of the Signal Service in the regular army and 8 years before it was transferred to the Department of Agriculture.

Our home was in the little village of Palmetto on the extreme western boundary of Bedford County - 12.5 miles from the county seat. Just across the road from "our house" was the U.S. Post Office in the rear. This was no common ordinary store, but an institution of higher learning. My father as truly dispensed from the front porch of the store as did the Stoic philosophers from their porch in the marketplace at Athens. Along about four o'clock of the afternoon the porch meeting adjourned in the middle of the pike and a pair of opera glasses, swayed hand to hand and eye to eye, crowded watched for the mail. And then my father the hack which brought up the newspaper and read the news of the outside world. His own weather records compared earlier in the day with his neighbors' observations and with the memory of the older inhabitants now met with the outside world.

His own weather records ... now met comparison with the outside world.

And now that I have the opportunity to speak, my heart fills so with emotion the words are choked back and with Tennyson I cry, "And I would that I could utter the thoughts that arise in me." That little latticed shed, or instrument shelter, in the yard back home does not seem to me to house mere instruments of wood and metal. Those instruments are a part of my family and as dear to me as some cherished heirloom to another. And why shouldn't I love them when I recall the days that used to be?

My father, R.S. Montgomery, known to his peers as Col. Bob,

One glance at the little shed has the power to

I saw the clock hands moving forward and realized it was almost time for the mail and the monthly record must be made out....

these scenes of the past -- the long ago past, for in 1902 the Rural Free Delivery came up our pike and since every man then could have a newspaper delivered to his own front porch, the mail hack was discontinued, the Post Office was abolished, the Store Porch Forum of the People lost its prestige, the dear old philosopher of the store porch closed his earthly records in 1905 and opened the book of life above. Last of all the store burned, but the weather records and the instruments remained and being intrusted to me were moved into the yard of my new home a few steps farther down the road.

At first I loved them because of my father, later for their own sake or shall I say because through association with my own babies they became almost like one of the children. For more than twenty-two years they have stood in my yard with the pride of their thirty-eight years of unbroken record which

"Through days of sorrow and of mirth, Through days of death and days of birth, Through every swift vicissitude Of changeful time"

unbroken had stood until last summer I was absent for ten days and not even the most insistent S.O.S could secure a substitute. Full explanations and sincere apologies were sent to headquarters which were kindly accepted.

Even the fondest mother, however, at times becomes irritated with her children, so I must confess there have been times when I wished I had never seen that shed with its instruments or at least I had never consented to be a cooperative observer. Doubtless this was when I had to arise early, cook the breakfast, get some of the children

off to school, see after the ones who were too small to go, look after coops and brooders full of hungry chicks crying for their feed and perform the hundred other odd tasks that confront the farm-wife each morning, while out of the corner of my eye I saw the clock hands moving forward and realized it was almost time for the mail and the monthly record must be made out and sent in today; then it seemed as if even a camel's back couldn't stand that last straw. The sea was too far away for me to wish the shed and its contents sunk in its depths -- but winds blow over land as well as sea and we have had some worthy of the name of "cyclone" -- possibly I should say "hurricane" or "tornado" to be strict in the choice of names. Once the wind tipped over the shed, but it must have realized it housed government property for it left it lying on the ground.

This matter of recording the direction of the wind caused me to be subpoenaed as a witness in a lawsuit, which grew out of damage claimed for a barn supposed to have burned from sparks of a railroad engine. I was to bring my records and testify as to the direction of the wind on "said day of said burning." But the parties to the suit compromised and I did not have to appear in court. However, this little incident shows the necessity for care and accuracy in recording observations. If one could so far forget his honor as to enter any kind of record in lieu of the proper observations with the excuse, "*It doesn't matter anyway,*" such a record might be the very one requiring accuracy. Twice my records have enabled by neighbors to collect insurance, since they proved that an electrical storm occurred on the days that it was

Full explanations and sincere apologies were sent to headquarters

...those are only a few of the questions a cooperative observer is called upon to answer.

We then read the open book of the sky... [to] serve our fellowmen.

alleged a horse and a barn were struck by lightning.

The cooperative observer of the U.S. Weather Bureau certainly has an opportunity to prove that the initials U.S. stand for *Universal Service*. Once the County Fair Association received the loan of the rain gauge as they had protected their profits with a rain insurance. I would not undertake to say how many times on a winter night I have been summoned to the telephone to answer the questions, "Is it cold enough to drain the car?," "Should I put more cover over the potatoes?," etc. Or perhaps in the dry weather after a welcome shower, some one calls to ask whether the gauge shows rain enough to do the crops any good. Or, maybe, a heavy rain causes a call to settle an argument as to whether more rain fell in the high water of December 1926, or the high water of April of 1902.

Anyone who has tried to operate the question box for an entire neighborhood knows these are only a few of the questions a cooperative observer is called upon to answer.

How very, very often, I have the pleasure of showing a visitor or newcomer the maximum and the minimum thermometers, how they keep their register till I set them, explain the way to measure the rain, of keeping a daily record and noting the direction of the wind and character of the day, all of which must be made out once a month and sent to the Weather Bureau in Nashville. Usually this information calls forth words of appreciation and commendation, but there are some who are wont to ask, "Why do you do all this for nothing?" The easiest reply is: the compensation the Government could allow for this work would be

small yet there are many incompetent and irresponsible persons, who would take it for the price, small though it be. But the truest and best reason is deep within my heart and could not be understood by a disinterested listener.

In fancy I stand before the instrument, not at the time I set the thermometer and make my daily record, but this is the hour before bedtime and this is my observation; above me is the sky, "that beautiful parchment on which the sun and moon keep their diary." I see it "sometimes gentle, sometimes capricious, sometimes awful, never the same for two moments together, almost human in its passions, almost spiritual in its tenderness, almost divine in its infinity," and I am glad I am numbered even though in a humble way among those who scan the sky.

What an innumerable company they are, extending back to the very edge of time, including astrologers, soothsayers, diviners and what not, who interpreted the will of their gods by the skies.

It would be interesting to follow the development of the science of meteorology down to the present time, but it is enough to say that today we read the open book of the sky, not to determine how we may propitiate angry gods, but how we may serve our fellowmen. Through the agency of the Weather Bureau, millions of dollars' worth of crops are annually saved, ships at sea are warned, railroads regulate their shipments and other peace time activities are aided. During the war, accuracy of firing was aided and propitious times for gas attacks were selected.

...in 1939 a major change in observation method was initiated by the Weather Bureau...

Just as truly as we cooperatives have helped make the U.S. in U.S. Weather Bureau, stand for *Universal Service* so surely let us make it stand for *United Service*. Our part may be small, but if we unite in faithfully, conscientiously doing it, we will make a firm foundation for a grander structure.

I am recalled to the present by the question, "*Why do all this for nothing?*" and this time I answer, "*Is it nothing to have served my country, my fellowmen and the future?*"

Mrs. Ross Woods
Cooperative Observer
Palmetto, Tennessee
December 1927

Missing Instructions

Researchers at the Global Climate Laboratory of the National Climatic Data Center are in need of a copy of certain instruction booklets issued by the Weather Bureau during the years 1939 through 1943. The booklets are entitled "*Instructions for Preparing Meteorological Forms*" and were issued annually by the Weather Bureau beginning in 1891 and continuing through 1948 when they were discontinued. The booklets were about 15 to 20 pages and would have accompanied the old 1001, 1002, 1014, etc., forms. They had detailed instructions on how these forms were prepared and also observation methods prevalent during the period. The NCDC is in possession of all the booklets except for the years 1939 through 1943. If the instruction booklets were issued during these years, it appears they were not bound with the forms, but issued separately and likely thrown away at years' end.

Sunshine was measured by the same type thermometric recorder at all stations...

Current research at NCDC indicates that in 1939 a major change in observation method was initiated by the Weather Bureau. Of particular interest, the method in which daily sunrise to sunset cloud amount was estimated appears to have been drastically changed. Prior to 1939, mean daily cloud amounts were based upon an irregular observation schedule termed "frequent personal observations." Evidence indicates that in 1939 a regular hourly schedule of observation was initiated by Weather Bureau in regard to cloud amounts. The missing instruction booklets would pinpoint what year the mean daily sunrise to sunset cloud amounts were based upon hourly amounts and not "frequent personal observations."

Why is this important? Current climate research indicates that an increase in temperature caused by greenhouse gases could also result in increased cloud cover. The late 1930s through the 1940s saw a significant increase in cloud cover across the United States. However, simultaneous sunshine measurements indicate only a corresponding decrease of percent of possible sunshine of about 50%. Since sunshine and cloud cover are known to have a high negative correlation, there has either been a change in the relationship between these two parameters or a bias in one or both of the parameters. Sunshine was measured by the same type of thermometric recorder at all stations during the years in question. However, the change in daily cloud estimating methods occurred at precisely the time of the large increase in cloud cover. It is possible that observers which were required to look for observations at regular hourly intervals would have found more clouds than those

observers which observed on an irregular schedule. Serious biases may have been introduced into the cloud cover records due to this change in computation method.

Anyone with information concerning these missing instruction booklets for the years 1939 through 1943 are asked to contact Pete Steurer at the NCDC. Telephone FTS 672-0445 or (704) 259-0445. Any help will be greatly appreciated.

U. S. DEPARTMENT OF AGRICULTURE,
WEATHER BUREAU.

INSTRUCTIONS

PREPARING METEOROLOGICAL FORMS.

DIVISION OF CLIMATE AND CROP WEATHER.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1967

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