U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE
NATIONAL CLIMATIC DATA CENTER

THE STATE CLIMATOLOGIST

IN COOPERATION WITH THE
AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS

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NOAA Reorganization. Reference article in April 1982 issue of The State Climatologist. The National Environmental Satellite, Data and Information Service (NESDIS) came into being on 29 November 1982. NESDIS takes in the National Earth Satellite Service (NESS) and the Environmental Data and Information Service (EDIS). NESDIS is directed by Acting Assistant Administrator Dr. John H. McElroy. Acting Deputy Assistant Administrator for Satellites is Harold W. Yates and the Acting Deputy Assistant Administrator for Information Services is Margaret E. Courain. Under the newly organized NESDIS, the National Climatic Center will be known as the National Climatic Data Center (NCDC).

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New State Climatologists. We have two new faces in our ranks. Dr. Douglas Clark is the new State Climatologist for the State of Wisconsin, replacing Dr. Val L. Mitchell who has retired due to illness. Dr. Clark is working through the University of Wisconsin Extension, 1353 Meteorology & Space Science Building, 1225 West Dayton Street, Madison, WI 53706. His telephone number is 608-263-2374.

Mr. James Newman is now the State Climatologist for the State of Indiana. Mr. Newman replaces Mr. Larry Schaal who has retired. James is serving in an acting capacity until his appointment is confirmed. His address is Agronomy Department, Poultry Science Building, Purdue University, West Lafayette, IN 47907. He can be reached by telephone on 317-749-8100.

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Possible State Programs to be Established. Negotiations have been undertaken with Rhode Island, Mississippi, and Pennsylvania to establish a State Climatologist Program in each of these states. Details on these negotiations will follow as they become available.

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Clarification of Cooperative Data Processing System Output. The NCDC cooperative data processing system does produce original and edited data values as stated in Myron Molnau's Computer Committee Report (pg. 7, October 1982 State Climatologist). However, both values are present on a single tape and are available from a single tape copy. Also, a customer can select either type value or a combination of original and edit values based on the data quality flag.

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CLIMATOLOGICAL DATA BULLETIN. Additional information about daily and maximum temperatures will be included in the Climatological Data bulletin beginning January 1983.

Data from the Cooperative Observer network are checked by the National Climatic Data Center in order to produce a high quality archive file and CD bulletin. These checking procedures now include a method to objectively estimate maximum and minimum temperatures for cases of missing data or data that are highly suspect. Beginning in January 1983, the daily temperature tables will contain original data values plus estimated values for suspect or missing data.

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1951-80 Normals. The 1951-80 normals of temperature, precipitation, heating and cooling degree days are now available. Monthly normals for about 5500 stations have been printed and daily normals for about 300 stations are being printed. All of the normals data will also be available on microfiche and magnetic tape.

PRECIPITATION COLLECTION FOR ACID RAIN RESEARCH AT REFERENCE CLIMATOLOGICAL STATIONS (RCS)

Richard Cram
National Climatic Data Center

Acid rain has become one of the most discussed environmental problems. Scientists have found that acid precipitation, especially in the Northeast United States and Eastern Canada, can cause environmental damage to fish populations and possibly to forests and crops. This evidence of damage has spurred the Federal Government, along with state, local and private organizations, to investigate all aspects of acid rain.

Part of this activity has resulted in the establishment of a National Trends Network (NTN) where precipitation is collected, analyzed for pH and conductivity and sent to the Central Analytical Laboratory at the Illinois Water Survey to be analyzed for all major ions. The RCS network has been identified as a potential set of ideal locations for the NTN. All NTN sites sponsored by NOAA will also be National Atmospheric Deposition Program (NADP) sites. The NADP is a cooperative program begun in 1978.

Several of the 21 RCS sites are being investigated for inclusion in the NTN. Site surveys will continue through mid-1983. To date, one site, Logan, Utah, has been selected for the establishment of collection equipment for the analysis of precipitation.

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State of South Carolina
Water Resources Commission

Alfred H. Vang
Executive Director

John C. Purvis
State Climatologist

"Climatology with an accent on service" marks the South Carolina Climatological program. The purpose of the program is to meet the climatological needs of the citizens of South Carolina and this objective is accomplished through a variety of methods.

The organizational structure places the State Climatologist's office under the South Carolina Water Resources Commission; however, this office works in close cooperation with the South Carolina Research and Statistical Services Division, the South Carolina Emergency Preparedness Division, and the National Weather Service. Mr. John C. Purvis is the former Meteorologist-In-Charge of the Columbia National Weather Service Forecast Office and serves as State Climatologist. He is assisted by Mr. Mark Perry, of the South Carolina Research and Statistical Services Division. Both Purvis and Perry are quick to point out that the South Carolina climatological program would never have gotten off the ground without the support, assistance, advice and encouragement of Mr. William Bartlett, Special Projects Officer of the National Climatic Data Center (NCDC). THANKS BILL.

Climate affects everyone whether by our occupation, food supply, clothing, or our health. Requests for weather data from this target group are varied and range from the school age child who needs the highest temperature of record for a class assignment to an engineer who requires weather information for design purposes. A high priority is placed on responding to these requests. They are answered daily and are given individual attention.

One of the major users of weather information is the legal profession. Some of these professional's needs are strictly routine and require nothing more than a copy of a weather record. However, in other instances, the State Climatologist is called upon to provide documentation as to the weather at a particular time or place and quite often, some requests necessitate hours of research or interpretation of climate variables. Some of the legal needs for weather data are as unpredictable as the weather. For example, in one case, the defendant claimed that clear moonlight nights brought out an uncontrollable urge to burglarize and one attorney investigating a rape case, requested weather data to determine whether or not the noise of a thunderstorm drowned the victim's pleas for help.

Services to the construction industry is a recurring item. Rainfall, temperature, wind and humidity data are often needed to substantiate whether or not construction deadlines are met, or if the firm is subject to a late penalty.

The Climatological needs of agriculture also occupy an important part of the State Climatologist's duties. Support is provided in numerous ways including the provision of weekly material to the U.S. Department of Agriculture's Crop Reporting Service, continuing cooperation with Clemson University, maintenance of close contact with Clemson University's Agricultural Meteorologist, Dr. Dale Linville, and the National Oceanic and Atmospheric Administration, National Weather Service's Agricultural Weather Program for South Carolina. Following the disastrous freeze in the spring of 1982, the State Climatologist participated in the survey leading to the Governor's appeal for disaster relief for farmers.

Water resources management requires knowledge of climate data. Water, taken for granted in South Carolina because of its abundance, has been termed the State's greatest natural resource. Overuse and abuse of this vital resource is rapidly pushing State government authorities into a position where they must take a hard look at the problem and somehow try to balance the demand with supply. The State Climatologist's resources and expertise are being used to help develop a State Water Plan that, hopefully, will address the total water supply and demand for South Carolina.

STATE CLIMATOLOGIST, JOHN PURVIS, POINTS OUT 100-YEAR FLOOD LEVEL AT COLUMBIA SHOPING CENTER.

Ms. BARBARA WALLACE, IN ADDITION TO ADDING A TOUCH OF BEAUTY, ASSISTS IN MONTHLY PREPARATION OF PALMETTO STATE CLIMATE SUMMARY.

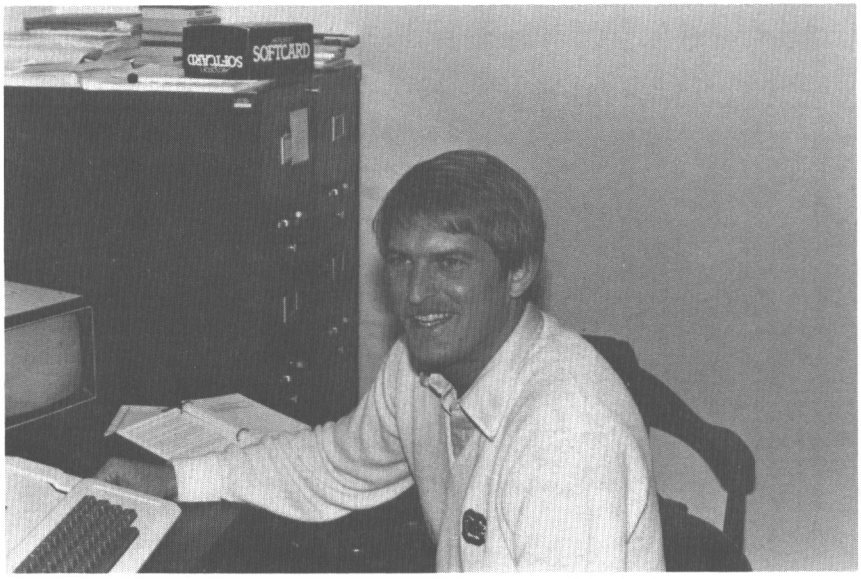
BILLY McKINNON, FLASH FLOOD SPECIALIST WITH SOUTH CAROLINA WATER RESOURCES, SHOWS HIGH WATER MARK USING INFORMATION PROVIDED BY THE STATE CLIMATOLOGIST.

The State Climatologist cooperates closely with the National Weather Service Forecast Office in surveying storm damage, in the monthly preparation of storm damage reports and in updating the severe weather climatology for the State.

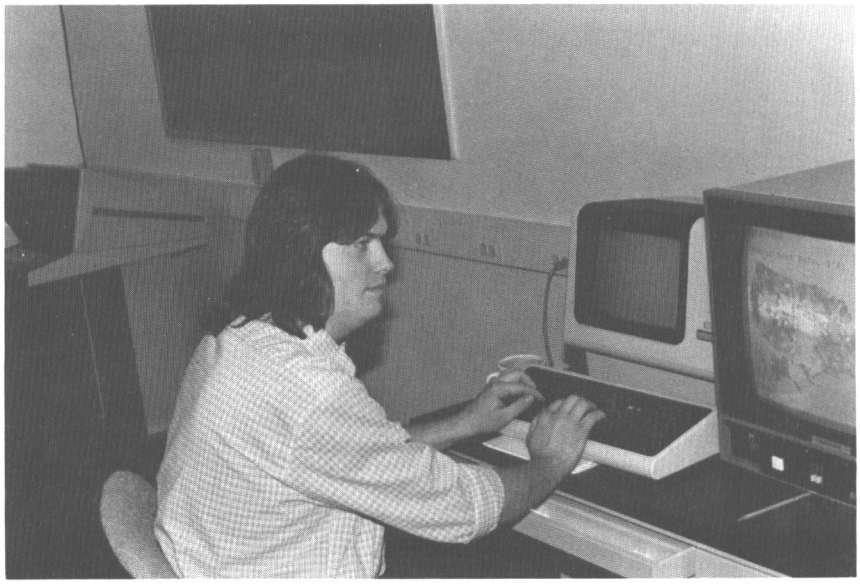
Support has also been given to the South Carolina Emergency Preparedness Agency in planning for natural disasters. The probability of rainfall heavy enough to produce flash flooding is being studied in connection with a program designed to encourage proper flash flood preparedness procedures. During periods of severe weather in South Carolina, such as hurricane passage, snow, or sleet emergencies, the State Climatologist acts as weather coordinator at the State Emergency Operating Center for the period of the emergency. The State Climatologist has produced a vulnerability analysis of the natural hazards affecting Richland County. Also, he is currently cooperating with emergency agencies, the South Carolina Coastal Council, and National Hurricane Center in Sea, Lake, and Overland Surges of a Hurricane (SLOSH) Model application to coastal South Carolina.

There also has been cooperative effort between the State Climatologist and the Computer Services of the University of South Carolina in the preparation of a hurricane impact study of the South Carolina coast. This interesting project includes a graphical computer analysis of the South Carolina coast using satellite imagery in defining land cover, land usage, and the economic impact to the population affected by a hurricane striking the South Carolina coast.

While the office of the State Climatologist is involved in updating its computer support, computer assistance has been provided by the Social and Behavorial Sciences (SBS) Laboratory of the University of South Carolina. The SBS Laboratory is headed by Dr. Dave Cowan; however, his assistant, Mr. Tim White, does most of the climatological computer applications for the State Climatologist Program.



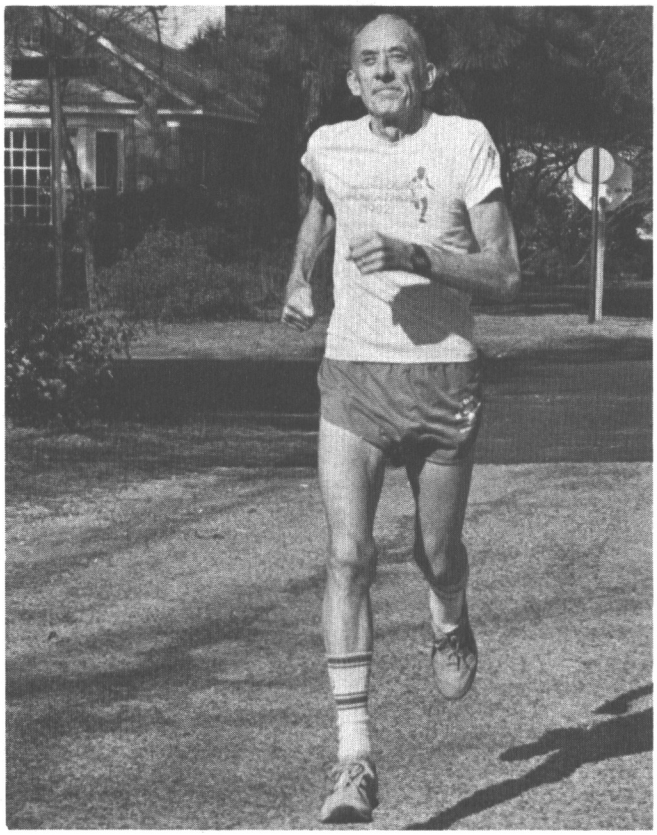
ASSISTANT STATE CLIMATOLOGIST MARK PERRY AT THE COMPUTER.



TIM WHITE PROVIDES INVALUABLE COMPUTER SUPPORT TO THE S.C. PROGRAM.

The on-going project with the NCDC where copies of substation records are sent directly to the State Climatologist, has worked well in South Carolina. The Climatologist reviews forms and calls errors to the attention of the Substation Network Specialist. This program enables the State Climatologist to distribute climatological information to users more rapidly. Also, data are collected for publication in a monthly State summary that is mailed, by the 5th of each month, to users throughout the State with urgent deadlines. No problems have been encountered in this on-going project--instead, it has been highly successful!

Today, the South Carolina Climatological program has not been fortunate enough to secure any type of demonstration program with the National Climate Program Office; however, proposals will continue to be forwarded since we have lots to offer.



CLIMATOLOGICAL INFORMATION TO RECREATIONAL INTEREST IS AN IMPORTANT FUNCTION OF THE STATE CLIMATOLOGIST. PICTURED HERE IS SOUTH CAROLINA'S CLIMATOLOGIST PUTTING THIS INFORMATION TO GOOD USE.

CLIMATE SERVICE TO THE LEGAL COMMUNITY IS A REGULAR FUNCTION OF THE STATE CLIMATOLOGIST.

IDEAS ON CLIMATIC CHANGE

by
E. Arlo Richardson
Utah State Climatologist

One of the most fascinating things about life in modern times is the capability of widespread, rapid communication of ideas. Since the weather has a strong influence on the welfare of all living organisms, this rapid exchange of ideas is felt very strongly in relation to the weather and/or climate of the earth. In looking through the assortment of magazines, papers and reports that come across my desk, it is fascinating to review the many ideas that are currently being circulated about changes in the weather and climate.

I suppose that growth in science has come about because of a desire to explain the natural phenomena and events taking place about us. However, due to the lack of knowledge of other scientific disciplines, many of the expressed concepts fail to consider important ideas developed in other areas of research. As a result, there is often a tendency to overemphasize certain aspects and negate or completely overlook important influences.

Let's look, for example, at the current emphasis that is being placed by some individuals on the impact of volcanic activity as represented by Mount St. Helens and the Mexican volcano, El Chichon. It has been recognized for many generations that dust clouds transferred to the stratosphere by volcanic eruptions will reduce the amount of solar radiation reaching the surface of the earth and, consequently, modify the climate. When Mount St. Helens erupted, there were predictions that it would produce drastic changes in the weather. In reality, the amount of dust and gases retained in the upper atmosphere was small in comparison to many other volcanoes in recorded history. Benjamin Franklin reported a dry fog in the early 1780s in Philadelphia that was so dense in the middle of the day that one could hardly see across the street. He further indicated that this dry fog did not disappear under the heat from the sun as most fogs do. This dry fog was associated with a very cool summer when crops failed to mature; and the winter was so cold that many streams, which usually remained open, froze solid allowing wagons and carts to be driven across them. Years later this dry fog was related to volcanic activity in Iceland. Today, we would have been aware of this activity within a few hours after it occurred; but then the news took months and sometimes years from the more remote areas of the world.

Let's look at the two recent, much publicized volcanoes, Mount St. Helens and El Chichon. An estimated 500 million metric tons of dust, ash and gases were hurled into the atmosphere by El Chichon. These amounts of debris were less than 1/6 the amount transported by Mount St. Helens. There are a few other differences, however, that should be recognized. First, the major force of the Mount St. Helens eruption was more nearly horizontal than the Mexican volcano. Second, the material reaching the stratosphere from El Chichon contained a large amount of salt. Third, El Chichon also released an unusual amount of sulfur dioxide. These latter two materials will increase the amount of absorption of the sun's rays a considerable amount.

However, on the other side of the coin, there is an often overlooked fact. El Chichon is located near 17 degrees north latitude which is in an area of the tropics where clouds blanket a large area of the surface of the earth. These clouds are already reflecting back much of the direct radiation aimed at the earth in the tropics so the addition of a little additional absorbing material

will not have as much influence as it would if released in the more temperate zones of the earth. For this reason, the reduction in the amount of solar energy reaching the ground will be considerably less than many have postulated. The clouds are already reducing the incident solar energy and the increase in reduction by the volcanic gases and dust will be minimal in comparison.

Further, when we look at climatic trends, we are already in a cooling trend in many parts of the northern hemisphere. The cause of this trend is not known, but there is a strong probability that the volcanoes will be given much of the credit, in spite of the fact that the trend was established long before the eruptions occurred. This is not to say that the volcanic dust and gases do not have an influence but simply that the impact of these two recent eruptions will be minimal in comparison with the climatic trends already established.

In some recent publications, much is made of the changes in the position of the JET STREAM in relation to changes in the weather. The jet stream is indicated as a weather control element. In reality, changes in the position of the jet stream are the result of changes in the circulation patterns that create the weather. The jet stream is a result, not a cause. True, its position can be correlated with changes in weather patterns; but it is not the causative agent.

Similarly, in some recent publications, changes in the sea surface temperatures are cited as causes of changes in the climate of the western United States. Again, there does seem to be a correlation; but such correlations do not establish a cause and effect relationship. Sea surface temperatures are the result of a combination of factors among which are winds associated with the circulation around various synoptic features of the weather map. These winds combine with differences in density of sea water, the upwelling of cold water along the coasts of continents to produce circulation patterns in the oceans that result in the water temperature anomalies. Again, they are the result and not the cause of changes in the weather circulation patterns. Of course, one must not overlook the fact that there is a feedback mechanism in that as the water temperature changes, so do the temperatures of the air in contact with these surfaces.

For many years, scientists have been studying the influence of sunspots on the earth's weather. Again, certain correlations have been found that look reasonable. However, the major problem with attempting to use the so-called sunspot cycle as a predictive tool is that sunspot cycles like weather cycles are not true cycles. The time period between maximum numbers of sunspots is not a constant. The average time between maximums is about 11.2 years, but that is an average value. Sometimes this period may last years longer or the period may be shorter. A further complicating factor is the number of spots associated with a given cycle. It appears that there is a definite change in the energy output of the sun associated with the development of these sunspots. Where there are a larger number or a lesser number, the energy output is modified accordingly. Thus, it is not just the cyclical nature of the occurrence of the spots and the associated energy change, but the degree of energy change associated with the number of spots.

Another factor which is being currently related to potential climatic change is the increase in carbon dioxide associated with our increased use of fossil fuels since the industrial revolution. Some scientists estimate that the carbon dioxide content of the atmosphere at the beginning of man's major use of fossil fuels was about 300 parts per million. Today, it has increased

to about 330 parts per million and some estimate that it will exceed 600 parts per million by the middle of the next century. There is considerable disagreement on just how this increase will modify the climate, but it is a matter of concern.

Another recent development that is causing concern is the introduction of aerosols from the increased use of spray cans and from high flying jet aircraft. The fear, in this situation, is the destruction of the ozone layer in the stratosphere.

In summary, while many of the factors discussed in this article may be contributing factors to climatic change, we must admit that as of the present time we still do not understand all of the physical processes involved in producing the changes in climate that have been observed by man and recorded in the rocks and plants over the centuries past.

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DUTIES AND RESPONSIBILITIES OF CHIEFS, REGIONAL COOPERATIVE PROGRAM MANAGEMENT OFFICES

There are six Chief, Regional Cooperative Program Management positions. These positions are located at various regional headquarters (Reference 1) under the direction of the Chief, Data Acquisition Division. The incumbent of each serves as Chief of the Regional Cooperative Weather Program and has overall responsibility for managing a network of cooperative weather stations which varies according to the resources of the region. (Reference 2).

The Cooperative Weather Program consists of the "a" or Climatological Network; "b" or Hydrological Network, the "c" Local use and Agrometeorological Network; and "ab" when is a combination of the "a" and "b" Networks. The staff responsible for these Networks work under the supervision of the Chief, Regional Cooperative Program Management and its size varies according to the policy of the individual region. (Reference 3) usually, a Q.C. Specialist and a typist. In three of the regions the field Cooperative Program Manager (CPM) is located in the regional headquarters. In addition there are 48 other Cooperative Program Managers strategically located throughout the Regions at Weather Service Forecast Offices and Weather Service Offices.

The responsibilities and duties of the Chief's position are extremely critical to the success of the cooperative program. Briefly they are:

- Directs, coordinates and administers all the work at the headquarters in accordance with policies and instructions from the National Weather Service Headquarters and Regional Offices.

- Responsible for the proper documentation of all cooperative stations, including the maintenance of the substation service accountability listing, cooperative station histories; and observer listings.

- Responsible for managing the Corps of Engineers reimbursable networks which includes preparing cost estimates each fiscal year and controlling the expenditures of his staff.

- Responsible for logistics involved in the operation of the cooperative stations.

- In consultation with appropriate regional program managers, authorizes the establishment of new cooperative weather stations and the moving of existing stations to expedite the flow of timely and accurate data into the collection centers.

- Travels, as necessary, to execute functional management responsibilities in the operational programs; and represents the Regional Headquarters at meetings and conferences related to the climatological and hydrological data collection.

- Initiates personnel actions and administers leave for his staff, including the Cooperative Program Managers.

- Advises program leaders in the Region and at National Weather Service Headquarters on strengths and weaknesses of the program and makes appropriate recommendations and changes.

The successful administration of the Cooperative Weather Program has a great impact on its cooperative observers and the data produced by this corps of dedicated individuals. The reliance upon good observational data, both for real time and climatology extends not only throughout the National Weather Service but beyond its boundaries due to the unique arrangement with other agencies (state and federal); private companies; universities; and private citizens. Agriculture interests are dependent upon advisories which to a large extent are based on cooperative station reports. In the area of hydrology, river stage and flood forecasts are primarily based on river and rainfall reports. During flash flooding these reports contribute to the saving of life and property. In addition, the published data provides vital information for industry and commerce.

REFERENCE 1

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REFERENCE 2

COOPERATIVE PROGRAM MANAGERS

JULY 1, 1982

Region	Nr. of CPM	Nr. of Stations	Avg. Stns. Per CPM	Total Sq. Miles	Sq. Miles Per CPM
Eastern	9	2,171	241	359,000	39,889
Southern	14	2,795	200	793,000	56,643
Central	15	3,719	248	952,000	63,467
Western	9	2,371	263	853,000	94,778
Alaska	1	212	212	-----	-----
Pacific	3	338	113	-----	-----
TOTAL	51	11,612	228	2,957,000*	63,694*

* NOT INCLUDING ALASKA AND PACIFIC

EASTERN REGION

Chief, Regional Cooperative Program Manager - Herbert E. Chadwick

Quality Control Specialist - Betty A. Borger

Clerk/Typist - Francisca Rivas

SOUTHERN REGION

Chief, Regional Cooperative Program Manager - Charles E. Ridge

Quality Officer - Helen S. Flippin

Cooperative Program Manager - Robert W. Manning

Clerk/Typist - Patrica M. Copers

CENTRAL REGION

Chief, Regional Cooperative Program Manager - Bernard L. Spittler

Quality Control Specialist - Nina P. Hawkins

Clerk/Typist - Donald W. Austin

WESTERN REGION

Chief, Regional Cooperative Program Manager - Thomas E. Adler

Cooperative Program Specialist - Ernest E. Eberhardt

Clerk/Typist - Sandra A. Bell

ALASKA REGION

Chief, Regional Cooperative Program Manager - Edward M. Misiewicz

PACIFIC REGION

Chief, Regional Cooperative Program Manager - Mark T. Takata

Cooperative Program Specialist - Roland P. L Ho

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