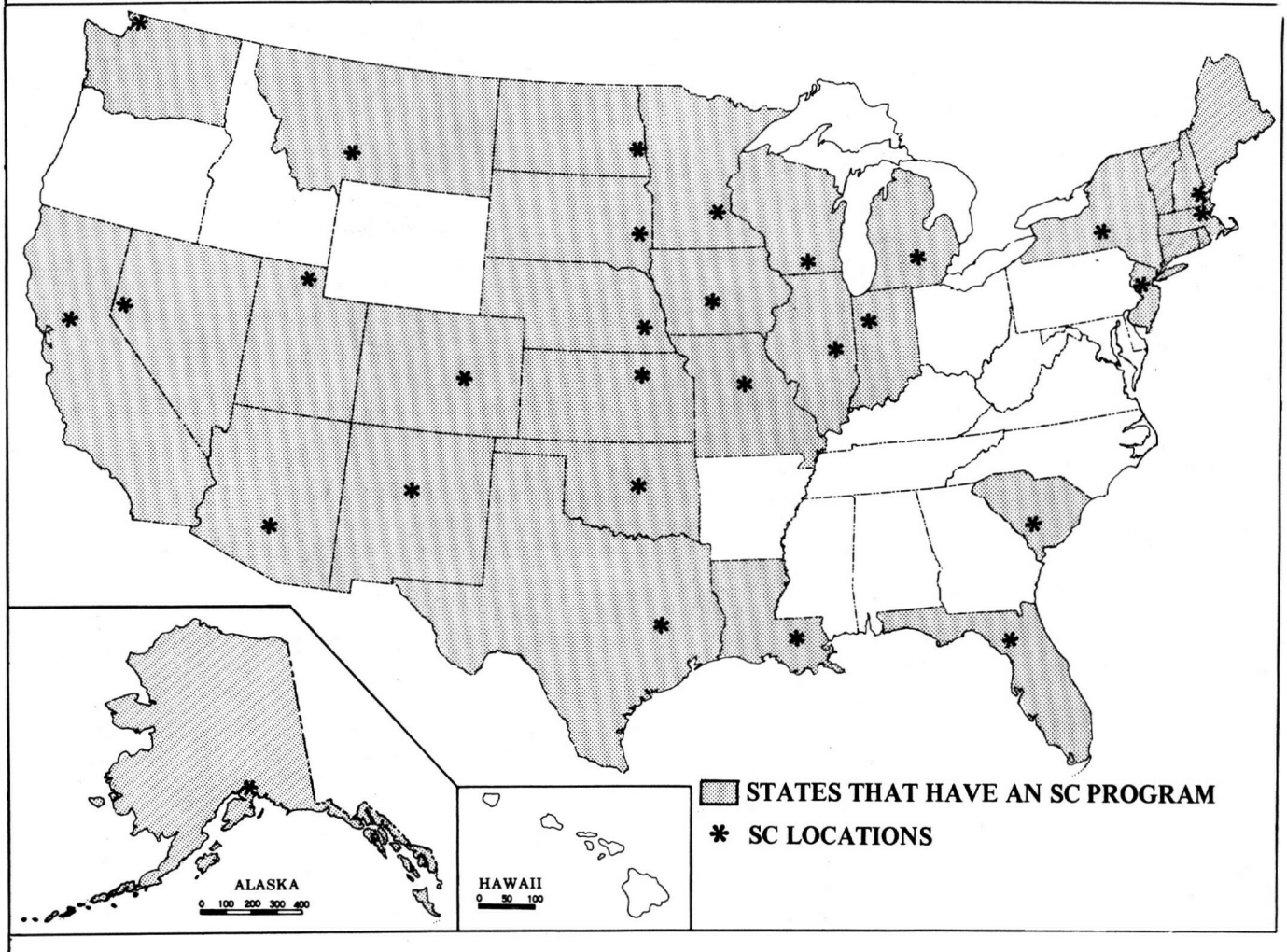
THE AMERICAN ASSOCIATION
OF STATE CLIMATOLOGISTS

NEWS LETTER



VOLUME 1 NUMBER 2 APRIL 1977
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NCC BRIEFS

AFOS STATUS AND DEVELOPMENTS

The formats of surface observations on AFOS have been finalized. We are now developing a new quality control program for the surface data.

The AFOS Subcommittee for Archiving and Servicing of System Products met on March 24 to explore ways of extracting data from the AFOS system and formatting the data for user requirements.

Auerback Associates, Inc., submitted to the National Weather Service its final report (dated March 16, 1977) on the design of the AFOS Centralized Archival System (CAS). That report has not yet been accepted.

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SOLAR RADIATION REHABILITATION PROJECT

Data for all 26 hourly stations have been rehabilitated, converted to the SOLMET format, and forwarded to ARL for input to regression models. Public dissemination of tapes will await completion of the regression analyses.

Clear solar noon analyses for an additional 25 daily stations are 90 percent complete. These data are being keyed for input to rehabilitation program and conversion to SOLDAY format (SOLDAY is a format containing available daily solar radiation and collateral meteorological data).

ARL and EDS have developed standards criteria for the acceptance of non-NOAA solar radiation data (i.e. cooperator data) into the NCC data base. These criteria will serve as the basic input into the NOAA policy for acceptance of cooperator data. The NCC has been asked by ERDA to collect, quality control, and archive the cooperator data. We are currently evaluating our personnel situation (i.e. ceilings) before entering into a formal agreement.

Plans for publication of solar radiation data are underway. It will be late May before clean data from the new NWS network are available for publication. The printing authority situation will be explored when a publication dummy is prepared and coordinated with ARL and ERDA.

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SPECIAL PUBLICATIONS

Climates of the States (Climate of the U. S. No. 60). Revised and updated issues for 14 additional States in this series were printed. They are: Minnesota, Mississippi, New Hampshire, New Jersey, New Mexico, New York,

Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, and Wyoming. Revised and updated issues in this series are now available for 31 States.

Publications in the new series Airport Climatological Summary have been printed for the first 20 stations in the planned 170 station set. These publications, based upon the 10-year period 1965-1974, are intended for use by aviation interests. The publications for the remaining 150 stations will be accomplished during the next two and one-half years.

Comparative Climate Data Through 1976 has been cleared for publication by the Office of Publications, Department of Commerce. May 1 is the expected publication date. The tabular data will be prepared for printing by the COM process; 5,000 copies will be printed. A price of $1.50 has been established for the publication. Most copies will be distributed on a complimentary, introductory basis to the media (newspapers, television stations, radio stations, etc.) and selected NOAA offices. The distribution list is being prepared by the EDS Publications and Media Staff.

WMO Catalogue of Meteorological Data for Research. NCC has been asked to prepare an updated version of the U. S. portion of this catalogue which was assembled by EDS in 1969. All contributors to the existing catalogue plus several other potential contributors have been requested to provide their updated and/or original material for the updated U. S. version by June 1, 1977.

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Since NCC's announcement in the last AASC Newsletter that SC's are eligible to receive NCC's filmed records, a number of SC's have written to NCC requesting such records when ready for disposal. This is encouraging because NCC wants to place these records where they will do the most good.

For those of you who have not requested manuscript records after they have been filmed, it is not too late. NCC will welcome your request at any time and is ready and willing to answer your questions by phone or letter.

NCC will be happy to deposit these records in State archives in those cases where SC's do not have storage space, but wish to have the records archived somewhere in their State. SC's that fall in this category should coordinate with NCC in developing the mechanics for such an arrangement. Such negotiations are already underway with the State of Washington.

Some SC's are under the impression that NCC plans to dispose of the Cooperative Observer's Records only. This is not true! NCC plans to dispose of all records placed on film in accordance with federally approved specifications. This means that SC's, if interested, are eligible to receive all types of records, including winds aloft (WBAN 20), rawinsonde/radiosonde (WBAN 31), barograph charts, thermograph

charts, rain gage charts, radar records and solar radiation charts. When you write to NCC, please tell them which records you wish to receive. If you have already written to NCC, and have not expressed your interest, don't worry about it because NCC will contact you for further instructions when they are ready to release any kind of records.

NCC will soon be ready to dispose of machine-produced monthly winds aloft summaries (WBAN 22) and monthly rawinsonde/radiosonde summaries (WBAN 33). These summaries are assembled in Endlock Post, Full Canvas, hard binders. One binder usually contains three to six months of summaries for several years. NCC plans to give these summaries, binders and all, to interested SC's or State archives. SC's should contact Bill Bartlett by phone or letter if they have questions on this program.

Lastly, NCC has a surplus supply of World Weather Records for the period 1941-60. There are seven volumes in all, and each volume is bound in green, hard, book-cloth covers with gold print. Upon request, SC's may receive one or more sets of these seven volumes without charge. When placing your order, please specify the number of sets desired and for what purpose, and NCC will satisfy your requirements insofar as possible. These books are not to be sold since they will be provided as a public service.

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NCC is pleased to announce that three more States, Florida, New Hampshire, and New Mexico, have recently established SC positions. The new SC's are as follows:

DR. CLARK I. CROSS
Department of Geography
University of Florida
Gainesville, FL 32611

DR. GERARD PREGENT
Department of Geography
University of New Hampshire
Durham, NH 03824

DR. IVEN BENNETT
Department of Geography
University of New Mexico
Albuquerque, NM 87131

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CLOUD SEEDING FOR STATE DISCOURAGED BY EXPERT

By Robert C. Bjorklund

(Reprint from the Wisconsin State Journal)

The state climatologist said Monday Wisconsin shouldn't get involved in cloud seeding because of its expense and uncertainities of success.

Val L. Mitchell of University of Wisconsin-Extension said the technology to seed clouds effectively to bring rain is not well developed.

He told the Governor's Drought Task Force he met with 50 northeast Wisconsin farmers who are exploring the cloud seeding idea with a Colorado firm and came out in opposition to the proposal.

Mitchell, who has had four years' research experience in Montana in weather modification, said his reasons were not based on possible damage to the environment.

"My biggest concern is that, in a drought situation, it is not worth the economic investment required. To seed for a couple of months, the Colorado company is talking between $75,000 and $100,000," he said.

"For that amount of money, there is no guarantee of an increase in precipitation. The company can't possibly make any guarantee. The technology of cloud seeding has not been demonstrated in a climate similar enough to Wisconsin to have any idea whether or not you're going to get anything for your money," Mitchell said.

He emphasized that there is another side to the story and that the whole area of cloud seeding was controversial.

There has been successful cloud seeding in southern Florida, but the climate is different from that of Wisconsin and may not work the same here.

"Just to seed without some careful evaluation - which is almost impossible when all you're trying to do is make it rain - means you could seed all summer long and spend $100,000 and still not know whether or not you have done any good," he said.

Cloud seeding - known as a form of weather modification - has been under development for 25 years.

During that time, knowledge has been gained which permits man, in some cases, to modify natural processes so clouds produce more precipitation than they would otherwise.

He added that, as research progressed, evidence supporting the effectiveness of certain seeding techniques has grown, tending to reduce the controversy over cloud seeding.

As a result, the technology of modifying winter storms over mountainous terrain is considerably more advanced than the technology of modifying summertime cumulus clouds, he said.

During a drought, there is a strong tendency to consider cloud seeding to break the drought, he said.

"It would be helpful if cloud seeding could be counted on to break a drought, but this is probably not realistic. Even during periods of normal precipitation, not every cloud is suitable for seeding. During a drought, the number of clouds is reduced, thus cutting the number of seeding opportunities," he said.

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DROUGHT: A SPECIAL REPORT

(Reprint from Des Moines Sunday Register, February 6, 1977)

For now, winter dormancy has calmed a violence that's gone on beneath us.

In scattered areas of the Midwest, the dry conditions of summer and fall sent roots on deep, divisive routes through the soil — or horizontally through thick cement walls of cisterns — to moisture.

The harvest, in some places bountiful, sucked the ground drier yet.

Hope grew for early-winter moisture, but little came. And now, snowfall is far below normal. Snow never contributes much to ground water, but it is counted upon to feed streams and protect the soil against wind erosion.

Drought?

After an extensive survey of the Midwest by Register staff members in recent weeks, we answer:

- In Minnesota and South Dakota — Yes, the worst of the century.
- In Iowa, Missouri, Nebraska, Wisconsin, North Dakota, Oklahoma, Colorado and Kansas — Maybe.
- In Illinois, Indiana and Texas — No.

Beyond the region, the entire western half of the nation is drier than normal, with large areas of California claiming drought. And some provinces in Canada, according to dispatches, would fit our "maybe" category.

In 1976, farmer applications to the U.S. Department of Agriculture (USDA) for disaster payments rose by 48 per cent, largely because of dryness. And yet, the USDA also reported record crops of corn and wheat.

The seemingly paradoxical situation is much the same in Iowa, where in a dry year, the average corn yield per acre was 90 bushels — which is down from the record yields of the early 1970s, but still not bad. And one corn grower, Eldon Prybil, of Iowa City, boasted the modern state contest record yield of 209.82 bushels per acre.

But there's good reason why federal agriculture officials are now considering more extensive drought relief programs: Good harvests on already-dry land have left the ground badly depleted of moisture.

Why tell the story now? We certainly don't do it to scare anyone, or to predict drought. In fact, Register Farm Editor Don Muhm has it figured that rain is coming — that the drought, if we had one, is gone. Still, we think it important to assess the condition we in the Midwest find ourselves in as we head into what could be one of the most pivotal agriculture periods in 20 years or more. What happens will affect all of us, farmers and townsmen alike.

The general picture in the farm belt is that dryness has reduced crop yields the past three years. It's come at a time when livestock producers have been taking staggering losses in depressed markets.

Farmers have been forced to refinance their precious land to obtain operating money, and as a result, farm debt is soaring. Says South Dakota state agriculture official Al Griffiths: "I think agriculture throughout the upper Midwest has good reason to be skeptic."

But not *just* agriculture.

Farm suppliers — implement dealers, for example — are already feeling the pinch of decreased farmer spending, and it threatens to spread up and down the mainstreets of the Midwest if conditions don't change.

The economies of most Midwest states are diversified between agriculture and industry. It's a pet contention that agriculture serves as a steadying influence, protecting the region against the periodic ups and downs that more industrialized areas suffer. But, as the Minneapolis Tribune recently noted, "If drought continues, the old shock absorber could be the source of shock waves."

Meanwhile, many towns and cities are reporting depleted water supplies and are imposing strict conservation measures. In some places, "water fights" — legal battles over who has rights to what water — are taking shape.

And outdoor recreational activities — especially in Minnesota and Wisconsin — are being tightly controlled for fear of fires caused by careless people.

Why? Rainfall shortage is the obvious answer; Iowa, for example, in 1976 had the driest May-to-December in the 104 years of climatic records.

But there's another answer, too. Human water consumption has risen almost incredibly.

Total U.S. water withdrawals have multiplied nine times since 1900 to meet today's demand of 160 gallons per person a day, compared to about 10 gallons per person daily around the turn of the century.

"When the well's dry, we know the worth of water," Benjamin Franklin once said. Midwesterners are drinking to that.

Drought, while such a serious phenomenon, is a fickle one, too.

In agriculture, the timing of rain is usually more important than the amount received. An example:

Students from Kirkwood Community College of Cedar Rapids made $70 profit per acre raising corn in 1976; the year before, they lost nearly $10 per acre. The reason: In the critical months of June and July in 1976, the area received 1.8 inches more rainfall than in the same period of 1975. That was the difference between 115-bushel corn in 1976 and 89-bushel corn the year before. A 26-bushel-per-acre difference because of less than two inches of rain!

Why does drought occur?

One of the most common theories is that spots on the sun affect weather in such a way that droughts occur in 20-year cycles. Says Robert Duxbury, South Dakota Secretary of Agriculture: "I don't understand the theory, but I like it, because from what I hear the sun spots are moving the drought center away from us. That's good enough for me."

And then there's the Raymond Spiegel theory. Spiegel, in the midst of a very localized drought in 1968 in his home area of Hamburg, Ia., philosophized that "some have just had it too damned good the last few years, and the good Lord thought He'd take care of them."

On such theories, it seems one's got as many disciples as the next, and no two people seem to agree on a definition.

But whatever it is, drought doesn't seem to stand and be recognized as it once did.

How was it? John Steinbeck, in *The Grapes of Wrath*, on the 1930s:

"... as the sharp sun struck day after day, the leaves of the young corn became less stiff and erect; they bent in a curve at first, and then, as the central ribs of strength grew weak, each leaf tilted downward ... The air was thin and the sky more pale; and every day the earth paled ... Every moving thing lifted the dust into the air: walking man lifted a thin layer as high as his waist, and a wagon lifted the dust as high as the fence tops, and an automobile boiled a cloud behind it. The dust was long in settling back again ... The dawn came, but no day. In the gray sky, a

red sun appeared, a dim red circle that gave a little light, like dusk; and as that day advanced, the dusk slipped back toward darkness, and the wind cried and whimpered over the fallen corn. Men and women huddled in their houses, and they tied handkerchiefs over their noses when they went out, and wore goggles to protect their eyes . . ."

Many things came together to make the 1930s drought the worst economic disaster in U.S. agricultural history.

Rainfall had been above average over a large area of the Great Basin and Southern Plains during the

preceding decade, encouraging farmers to plow up and plant lands that would normally be classified as desert.

With the cover of grass removed, these lands quickly fell prey to the rising winds that finally created the Dust Bowl. At its peak, this Dust Bowl covered 50 million acres and the clouds of dust were visible as far east as New York City.

In Iowa, droughts were most severe in 1934 and 1936, primarily in southern and western sections. State average corn yields were 28 bushels per acre in 1934 and 20 bushels in 1936 — the lowest since the 15 bushels per acre crop of 1894. Farm foreclosures were the daily fare — some being carried out under the guard of state troops.

Forty counties in the state were declared disaster areas in 1936, along with 40 in Nebraska and 97 in Missouri.

Concurrent with the drought, the nation was in the throes of economic crisis: The New Deal had not yet solved the Great Depression. With city people as strapped as the farmers there were simply not enough jobs and not enough relief to go around. Thus began the great Twentieth Century migration to a new life in California.

Yet for all the severity of the 1930s drought, weather records show that the drought of the 1950s was more severe. In fact, tree-ring records in Arizona show it was the driest period in the Southwest in some 700 years.

But the Dust Bowl miseries of the '30s were missing — the national economy was sound, federal relief programs were in good working order and those who had to leave the farms had little difficulty finding work elsewhere.

Through the worst of the drought — from 1953 through 1956 — Iowa's corn crop averaged 53, 54, 48 and 53 bushels per acre.

Why the dramatic yield differences from the 1930s? Improved farming, and it's improved even more in the years since.

In fact, the Omaha World-Herald recently characterized drought as now having been "de-fanged" by better crop hybrids, more fertilization, improved weed and pest control, irrigation and increased conservation of soil and water.

But don't go to Minnesota and South Dakota today and argue that technological advancement has made us immune.

In many ways, costs of technology — and the resulting costs of equipping for it — make us more panicky about drought or dryness than we were anytime previously.

Inflation of the 1970s made many farmers millionaires, at least on paper. For example, good crop-producing Iowa land that 15 years ago brought $300 an acre is now bringing $3,000 per acre, or more. Similar land value increases have occurred in other states as well.

Credit has become more readily available as farmers have increased their net worth statements. And their sudden wealth has often forced them to take advantage of the credit situation and expand — if for no other reason than tax deductions.

More land, more technology, more, more, more.

And add the costs of highly-sophisticated machinery, automated feedlots, livestock confinement buildings and the other Buck Rogers trappings of modern farming.

Understand the increasing pressure on farmers' cash flow?

The USDA says total farm debt as of Jan. 1 was up 12 per cent to $101.6 billion. Some $57 billion of that is reported as land debt, and the USDA predicts a record one-year rise of $7 billion in that category this year.

Plainly, the farm debt structure can ill-afford mediocrity in productivity and earnings.

But as dry weather has cut into crop yields, farm income has fallen. Loans still come due, however, and farmers find themselves in a cash bind.

The ability of farmers to refinance their land — which is there only because of appreciating land values — is the biggest reason that there as yet have been no farm foreclosures in the hardest-hit areas of drought.

Lenders apparently are still confident — at least in Iowa — that farm loans are solid investments.

Terry Francl, agricultural economist at the Seventh District Federal Reserve Bank in Chicago, Ill., says, "Frankly, I think the spiraling land prices have outpaced the gains in loans. The value is there.

"I'm not saying it won't be a problem if it (dryness) continues for some time," he adds.

In the less severe areas of drought in the Midwest, the most plaguing problem dryness has imposed is uncertainty. Will it spread? Will it intensify? Will it end?

It leaves most Midwestern farmers — at a time of year when planting decisions are normally being firmed — with the grossest sort of indecision about what to do.

The way they handle such adversity is an intriguing part of the farm ethic.

"You can't take the attitude that it isn't going to rain and that we're all going to go broke," one South Dakotan said. "If you do, you're beat already."

And a Minnesota implement dealer says he's putting up a new building in 1977 because he thinks like the farmer. "The progressive farmer doesn't do business from one year to the next," he says, "and neither do I. You have to be optimistic. Half this is a game of mental attitude."

Joe Bohlen, an Iowa State University sociologist who's studied farmer attitudes for over 25 years, says the top farmers would take drought in stride. "They'll say, 'I'm not running . . . I'll be here when it's over'," Bohlen says.

"Meanwhile, they're going to play the odds, calculate the risks, get all the information they can and take every advantage of it they can."

On the other end of the farmer spectrum, he says, "you've got the traditionalists, the fatalists, who think man never controls anything. They look on it as an act of God and they're just going to go on doing what they're doing, because that's all they know to do."

Finally, the best advice we can give is the oldest advice in these situations: Pray for rain.

STATUS OF SUBSTATION NETWORKS

Eastern Region

State	Networks as of July 1, 1976 a	ab	b	c	Total	Networks as of Jan. 1, 1977 a	ab	b	c	Total	Net Changes a	ab	b	c	Total	Planned Network Not Implemented (a)
Connecticut	9	5	40	1	55	9	5	40	1	55	0	0	0	0	0	0
Delaware	4	2	2	3	11	4	2	2	3	11	0	0	0	0	0	0
Maine	31	14	33	1	79	32	14	34	0	80	+1	0	+1	-1	+1	7 (2)
Maryland	23	7	25	34	89	23	7	25	33	88	0	0	0	-1	-1	0
Massachusetts	15	14	72	8	109	15	14	71	7	107	0	0	-1	-1	-2	1
New Hampshire	7	18	56	4	85	7	18	55	3	83	0	0	-1	-1	-2	1
New Jersey	7	12	60	17	96	7	12	60	17	96	0	0	0	0	0	0
New York	36	52	218	33	339	36	53	214	31	334	0	+1	-4	-2	-5	7
North Carolina	45	45	106	35	231	45	46	107	24	222	0	+1	+1	-11	-9	0
Ohio	15	56	177	17	265	15	56	178	17	266	0	0	+1	0	+1	0
Pennsylvania	10	69	224	43	346	10	69	223	42	344	0	0	-1	-1	-2	6 (1)
Rhode Island	1	3	3	0	7	1	3	3	0	7	0	0	0	0	0	0
South Carolina	23	32	55	24	134	23	32	55	24	134	0	0	0	0	0	0
Vermont	7	8	56	5	76	7	8	54	5	74	0	0	-2	0	-2	0
Virginia	30	45	129	21	225	27	47	130	17	221	-3	+2	+1	-4	-4	0
West Virginia	18	39	99	7	163	18	39	98	6	161	0	0	-1	-1	-2	0
Totals	281	421	1,355	253	2,310	279	425	1,349	230	2,283	-2	+4	-6	-23	-27	22 (3)

Southern Region

Alabama	37	42	89	9	177	37	42	90	5	174	0	0	+1	-4	-3	4
Arkansas	23	64	137	1	225	23	64	135	1	223	0	0	-2	0	-2	5
Florida	55	42	47	12	156	55	42	46	8	151	0	0	-1	-4	-5	5
Georgia	39	48	136	10	233	39	48	136	10	233	0	0	0	0	0	1
Louisiana	28	41	92	8	169	27	42	95	6	170	-1	+1	+3	-2	+1	6 (1)
Mississippi	23	53	107	4	187	23	53	110	4	190	0	0	+3	0	+3	3 (1)
New Mexico	64	73	95	11	243	64	73	69	6	212	0	0	-26	-5	-31	52 (23)
Oklahoma	12	96	220	1	329	12	96	224	1	333	0	0	+4	0	+4	2
Tennessee	43	32	64	10	149	42	33	66	4	145	-1	+1	+2	-6	-4	0
Texas	80	235	538	16	869	82	231	537	13	863	+2	-4	-1	-3	-6	85 (60)
Puerto Rico & Virgin Islands	1	29	94	7	131	1	30	94	7	132	0	+1	0	0	+1	0
Totals	405	755	1,619	89	2,868	405	754	1,602	65	2,826	0	-1	-17	-24	-42	163 (85)

Central Region

Colorado	6	127	176	11	320	8	130	154	3	295	+2	+3	-22	-8	-25	51 (37)
Illinois	19	72	162	8	261	18	75	161	0	254	-1	+3	-1	-8	-7	0
Indiana	22	52	98	20	192	23	51	109	19	202	+1	-1	+11	-1	+10	0
Iowa	11	91	185	6	293	11	92	184	4	291	0	+1	-1	-2	-2	0
Kansas	9	106	324	2	441	9	106	326	1	442	0	0	+2	-1	+1	0
Kentucky	28	45	124	13	210	28	45	124	13	210	0	0	0	0	0	0
Michigan	38	63	158	37	296	41	62	158	36	297	+3	-1	0	-1	+1	0
Minnesota	16	110	109	21	256	16	110	111	21	258	0	0	+2	0	+2	0
Missouri	8	108	198	5	319	8	108	198	5	319	0	0	0	0	0	1
Nebraska	4	110	226	3	343	5	112	225	0	342	+1	+2	-1	-3	-1	2 (1)
North Dakota	1	103	113	1	218	1	103	114	1	219	0	0	+1	0	+1	0
South Dakota	12	103	77	6	198	12	103	77	6	198	0	0	0	0	0	2
Wisconsin	3	102	107	9	221	3	102	107	9	221	0	0	0	0	0	0
Wyoming	17	109	96	3	225	17	109	96	3	225	0	0	0	0	0	47 (10)
Totals	194	1,301	2,153	145	3,793	200	1,308	2,144	121	3,773	+6	+7	-9	-24	-20	103 (48)

Western Region

Arizona	32	114	103	16	265	40	115	75	2	232	+8	+1	-28	-14	-33	44 (11)
California	134	129	568	37	868	133	129	491	35	788	-1	0	-77	-2	-80	15
Idaho	38	74	114	15	241	38	75	70	16	199	0	+1	-44	+1	-42	35 (21)
Montana	41	170	172	10	393	40	170	161	10	381	-1	0	-11	0	-12	28 (9)
Nevada	41	53	68	2	164	41	53	19	1	114	0	0	-49	-1	-50	78 (57)
Oregon	10	156	275	13	454	10	155	199	14	378	0	-1	-76	+1	-76	15 (4)
Utah	42	84	100	7	233	42	86	64	6	198	0	+2	-36	-1	-35	33 (23)
Washington	46	81	165	9	301	45	81	132	8	266	-1	0	-33	-1	-35	7 (2)
Totals	384	861	1,565	109	2,919	389	864	1,211	92	2,556	+5	+3	-354	-17	-363	255 (127)

Alaska Region

Alaska	136	34	51	0	221	132	36	50	0	218	-4	+2	-1	0	-3	0

Pacific Region

Hawaii	0	35	262	7	304	0	32	253	7	292	0	-3	-9	0	-12	0
Grand Totals	1,400	3,407	7,005	603	12,415	1,405	3,419	6,609	515	11,948	+5	+12	-396	-88	-467	543 (263)

The figures in parenthesis beside the planned (a) network indicate the number of locations approved for that type of substations which cannot be established at this time due to location in an uninhabited area, etc. Also included in the above figures are 544 first- and second-order stations with network designations.

Alaska has no definite number of stations in the planned network due to circumstances peculiar to that area.

Status Report of Substations by States for 1976

State	January 1, 1976	December 31, 1976	Net Change
Alabama	175	174	-1
Alaska	224	218	-6
Arizona	265	232	-33
Arkansas	225	223	-2
California	876	788	-88
Colorado	314	295	-19
Connecticut	55	55	0
Delaware	11	11	0
Florida	156	151	-5
Georgia	231	233	+2
Hawaii	302	292	-10
Idaho	241	199	-42
Illinois	266	254	-12
Indiana	193	202	+9
Iowa	296	291	-5
Kansas	444	442	-2
Kentucky	210	210	0
Louisiana	170	170	0
Maine	79	80	+1
Maryland	92	88	-4
Massachusetts	112	107	-5
Michigan	270	297	+27
Minnesota	257	258	+1
Mississippi	188	190	+2
Missouri	316	319	+3
Montana	396	381	-15
Nebraska	346	342	-4
Nevada	167	114	-53
New Hampshire	89	83	-6
New Jersey	96	96	0
New Mexico	241	212	-29
New York	332	334	+2
North Carolina	232	222	-10
North Dakota	219	219	0
Ohio	266	266	0
Oklahoma	326	333	+7
Oregon	453	378	-75
Pennsylvania	350	344	-6
Rhode Island	7	7	0
South Carolina	135	134	-1
South Dakota	198	198	0
Tennessee	146	145	-1
Texas	869	863	-6
Utah	238	198	-40
Vermont	75	74	-1
Virginia	226	221	-5
Washington	304	266	-38
West Virginia	168	161	-7

Wisconsin	221	221	0
Wyoming	229	225	-4
Puerto Rico	132	132	0
TOTALS	12429	11948	-481

"b" and "c" Network Changes for 1976

	Jan. 1, 1976		Dec. 31,1976		Net Change		
Region	b	c	b	c	b	c	Total
Eastern	1362	260	1349	230	-13	-30	-43
Southern	1605	95	1602	65	-3	-30	-33
Central	2129	144	2144	121	+15	-23	-8
Western	1584	110	1211	92	-373	-18	-391
Alaska	49	1	50	0	+1	-1	0
Pacific	259	7	253	7	-6	0	-6
Totals	6988	617	6609	515	-379	-102	-481

Regional Report on Status Changes of Substations for 1976

Region	Jan. 1, 1976	Dec. 31, 1976	Net Change
Eastern	2325	2283	-42
Southern	2859	2826	-33
Central	3779	3773	-6
Western	2940	2556	-384
Alaska	224	218	-6
Pacific	302	292	-10
Totals	12,429	11,948	-481

Difference in individual region net change totals are due to converting some "b" and "c" network stations to the "a" and "ab" networks.