

U.S. DEPARTMENT OF ENERGY
STATE COUPLED RESOURCE ASSESSMENT PROGRAM
FINAL REPORT FOR FY 1983

by

Duncan Foley
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January, 1984

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SUMMARY

The State Coupled Program has been instrumental in identifying low- and moderate-temperature geothermal resources throughout the nation. In several cases, such as Pagosa Springs, Colorado, development has taken place that would not have occurred without the program. Twenty-two maps depicting geothermal resources have raised the profile of this alternative energy. Numerous reports produced within each state (Ruscetta and Foley, 1981b; Ruscetta, 1982b; and individual state final reports) have transferred the data compiled to public and technical audiences.

INTRODUCTION

The State Coupled Resource Assessment Program was initiated by the U.S. Department of Energy, Division of Geothermal Energy (presently Division of Geothermal and Hydropower Technologies) in 1977. The original goal of the program was to compile and publish state-by-state data concerning the nature and occurrence of low- and intermediate-temperature geothermal resources. It was felt that these resources could contribute significantly to the availability of alternate energy sources in the U.S., but at that time the lack of geoscientific data hindered development.

The State Coupled Program is a cost-shared program, with the DOE funding most of the work, but state agencies (either geological surveys, university groups or, in one case, a division of water rights) also funding a portion of the work. DOE and the states have both received technical support from contractors to DOE, including the Earth Science Laboratory/University of Utah Research Institute. Figure 1 depicts the regions that have been investigated during the program. State Coupled Program participants are listed in Appendix I with respective tasks listed in Table 1.

FIGURE 1
STATE COUPLED PROGRAM
PARTICIPANT STATES AND REGIONS

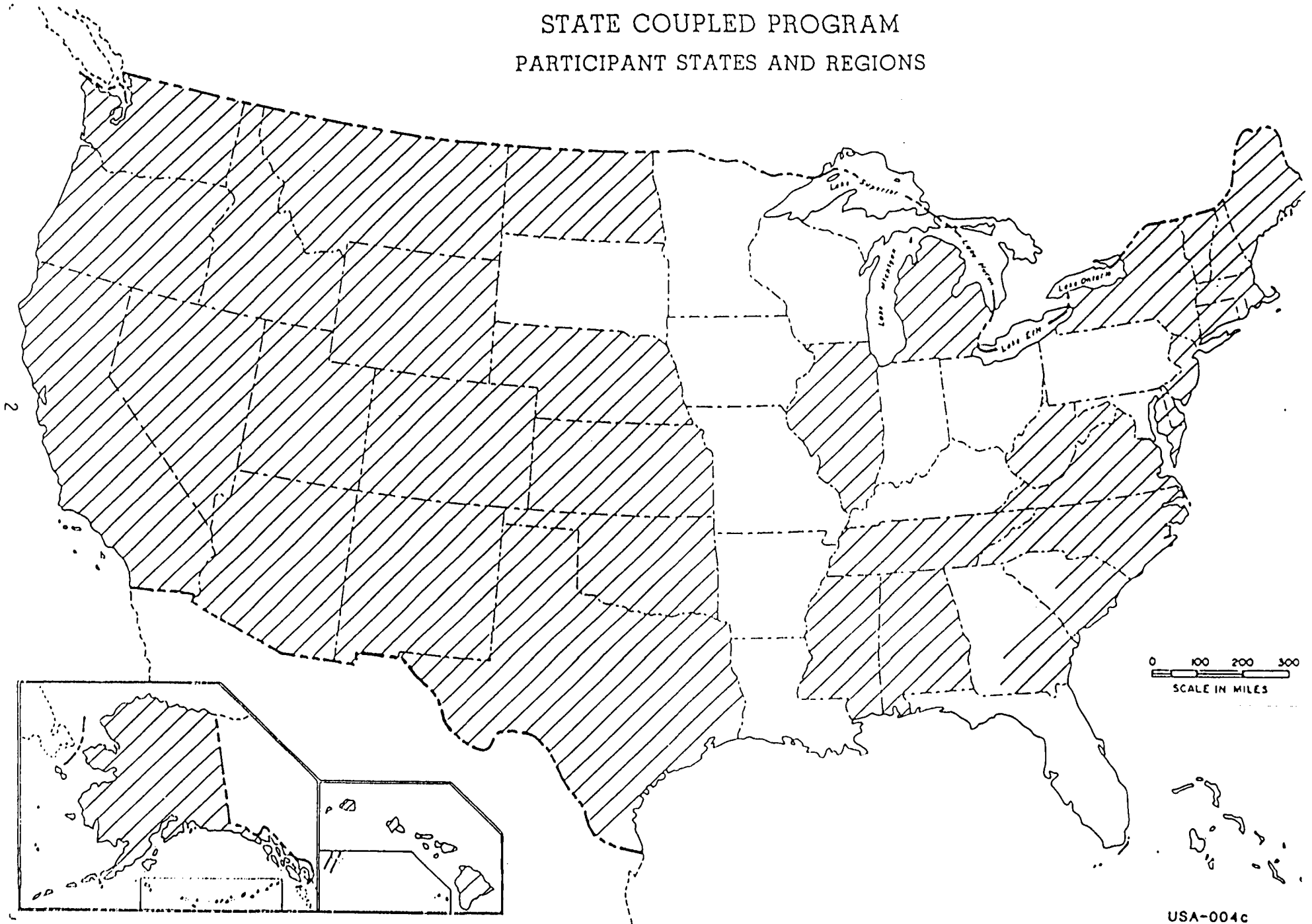


TABLE 1

RESPONSIBILITIES OF STATE COUPLED PROGRAM PARTICIPANTS

DOE - HEADQUARTERS (WASHINGTON)

Program Planning, Guidance, Priorities

DOE - OPERATIONS OFFICES

Program Guidance, Implementation, Contracting, Management

STATE CONTRACTORS

Performance of State Project

EARTH SCIENCE LABORATORY/UNIVERSITY OF UTAH RESEARCH INSTITUTE (ESL/UURI)

Communicate program objectives for 16 western states
Provide liasions among participants and other federal geothermal programs
Provide status reports
Convvene annual meetings
Technical support to states and DOE

LOS ALAMOS NATIONAL LABORATORY

For 2 states, tasks similar to ESL/UURI

GRUY FEDERAL

Regional inventory of midwestern and eastern resources
Technical support to DOE Headquarters

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Resource assessment along Atlantic coastal plain

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Publish resource maps

U.S. GEOLOGICAL SURVEY

Compile regional resource assessments
Store national geothermal data

The primary accomplishment of the State Coupled Program has been to increase the amount of data available about low- and intermediate-temperature geothermal resources. The increase in data has led directly to the expansion of several existing geothermal applications, and the development of new applications. Data generated by the State Coupled Program have also been used in promulgating legislative actions at local, state and federal levels.

The State Coupled Program has been a phased program, from regional tasks such as statewide inventories to more local and detailed resource assessments. The mix of tasks has had a wide range among states, and has varied from year-to-year within individual states. Table 2 presents a general summary of state activities, which tasks are discussed below.

The State Coupled Program has interfaced with several other federal geothermal programs, which were intended to promote commercialization of geothermal resources, support DOE data requirements, and provide data for national resource assessments. These other programs are also listed below.

Earth Science Laboratory/University of Utah Research Institute activities, which were typical of support contractors, are discussed in a separate section.

STATE PARTICIPANT TASKS

Geoscientific Data

At the initiation of the program, few integrated geoscientific data on geothermal resources existed for any state. Thus, statewide compilation of the occurrence, chemistry, and geologic nature of thermal springs and wells was the first major effort of the program. Other tasks have followed, including more detailed studies, publication of maps, and support of U.S. Geological Survey assessments.

TABLE 2

ACTIVITIES OF STATE PARTICIPANTS

Statewide Inventory - identify and assess all thermal springs and wells in a state, including locating previously unknown sites.

Regional Reconnaissance - study geothermal systems within geologic provinces of a state.

Area Exploration and Model Development - study individual thermal systems; develop models to explain the nature and occurrence of the resources; develop exploration strategies to locate new resources.

Map Production - develop maps depicting geothermal resources for technical and non-technical audiences.

Reporting - produce reports on resources.

User Assistance - answer questions from people interested in development of specific sites.

USGS Interface - provide data to USGS for their use in performing resource assessment and to archive.

Commercialization Planning Support - provide data to state agencies involved in promotion of geothermal resources.

DOE Requests for Data - provide requested data to DOE.

Statewide and regional studies of geothermal resources have emphasized direct identification of resources through temperature measurements rather than indirect identification, such as geophysical indications of probable sites. For the purpose of this program, a lower limit of 10°C above mean annual air temperature at a particular site has been used to define the lower limit of a thermal anomaly. Resources identified in most states have had temperatures under 100°C. The direct measuring of spring and well temperatures has resulted in the discovery of many previously unknown thermal sites within each state.

In addition to direct temperature measurements, many other geological, geochemical and geophysical techniques have been applied by program participants to the search for thermal water. These techniques, from a survey by ESL/UURI in 1981, are listed in Figures 2, 3, and 4. Success of individual exploration techniques has varied depending upon site conditions; individual state reports summarize conditions of applicability for these.

Many sites have been investigated by state participants; these are listed in Appendix II. State teams have also been active in the development of resource models, upon which exploration philosophies could be developed. The nature of geothermal resources is much better understood as a result of studies under this program.

State teams have also been responsible for the production of reports. These are cited in Ruscetta and Foley (1981b) and Ruscetta (1982), as well as in individual reports available from the state agencies cited in Appendix I.

Geothermal Resource Maps

The production of maps depicting geothermal resources in many states has been a major effort of the State Coupled Program. Twenty state maps, intended for use by the general public and non-geoscientific decision makers, have been

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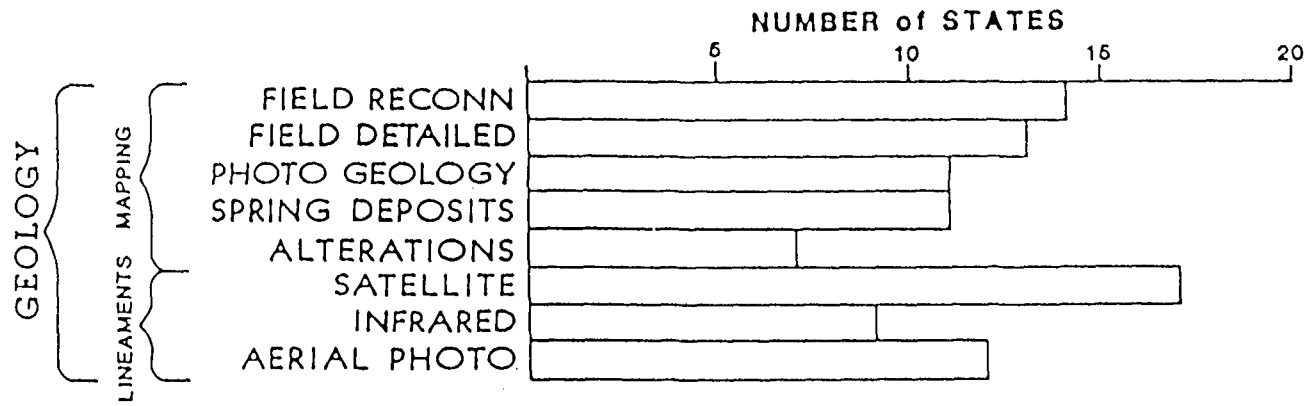


FIGURE 2 GEOLOGICAL EXPLORATION TECHNIQUES

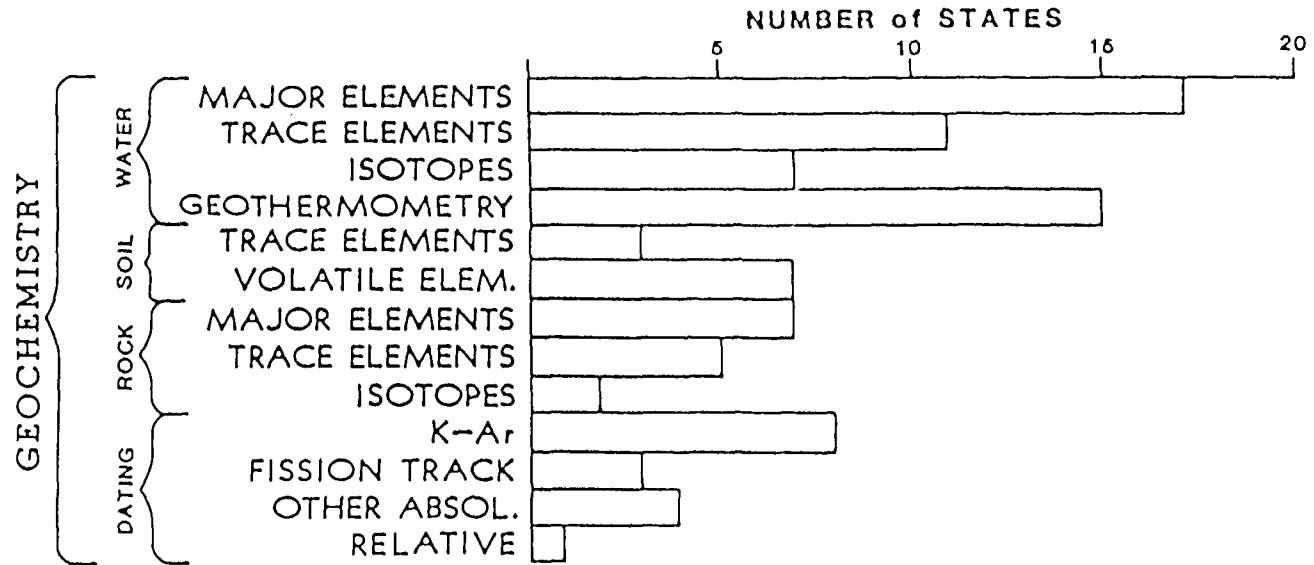


FIGURE 3 GEOCHEMICAL EXPLORATION TECHNIQUES

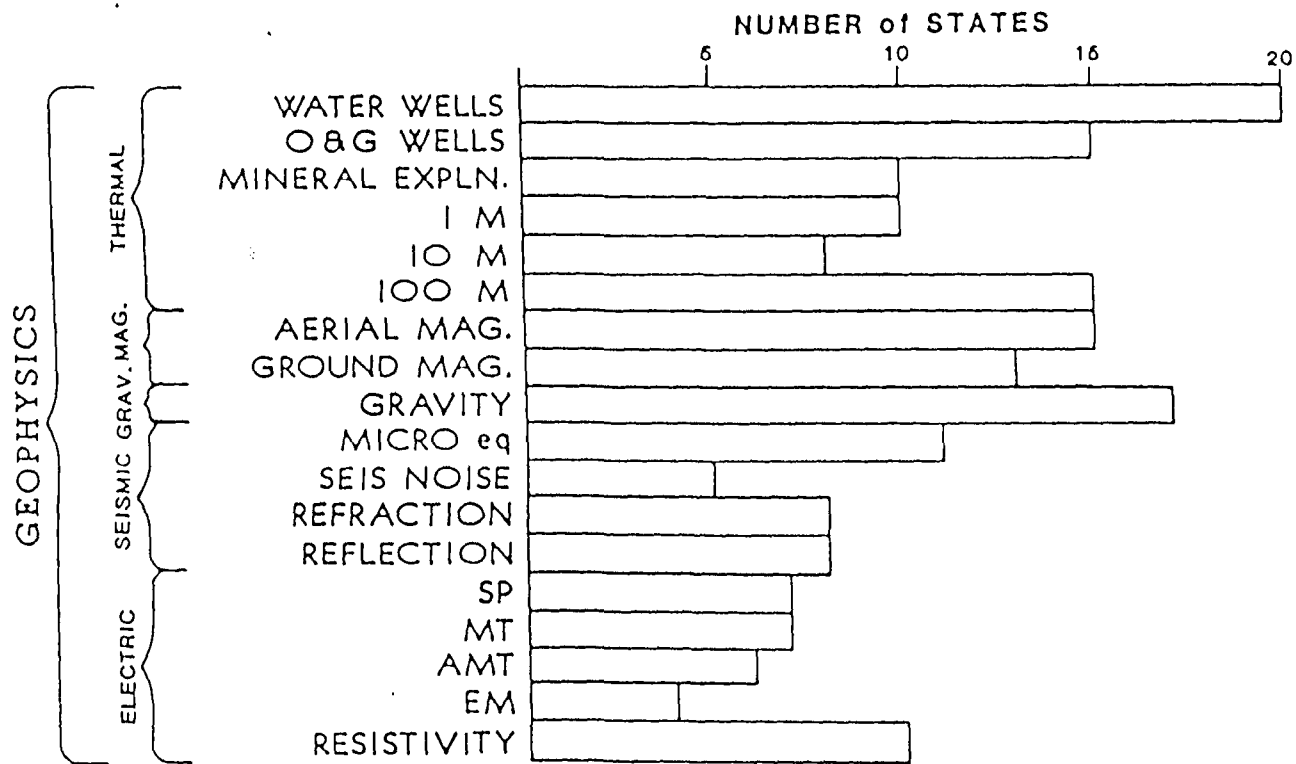


FIGURE 4 GEOPHYSICAL EXPLORATION TECHNIQUES

published; two maps directed toward a scientific audience have also been produced. Figure 5 depicts the states for which these maps have been produced. Maps are available from the respective state agencies listed in Appendix I and from NOAA (address in Appendix I).

Geoscientific data for the maps have been compiled by the individual state teams. These have included identification and characterization of geothermal sites, including thermal regime and water quantity and quality data. Technical maps present additional supporting geoscientific information. The maps also contain depictions of areas interpreted by the state teams as having highest potential for the existence of undiscovered resources. Geothermal data have been plotted on state topographic base maps produced by the U.S. Geological Survey.

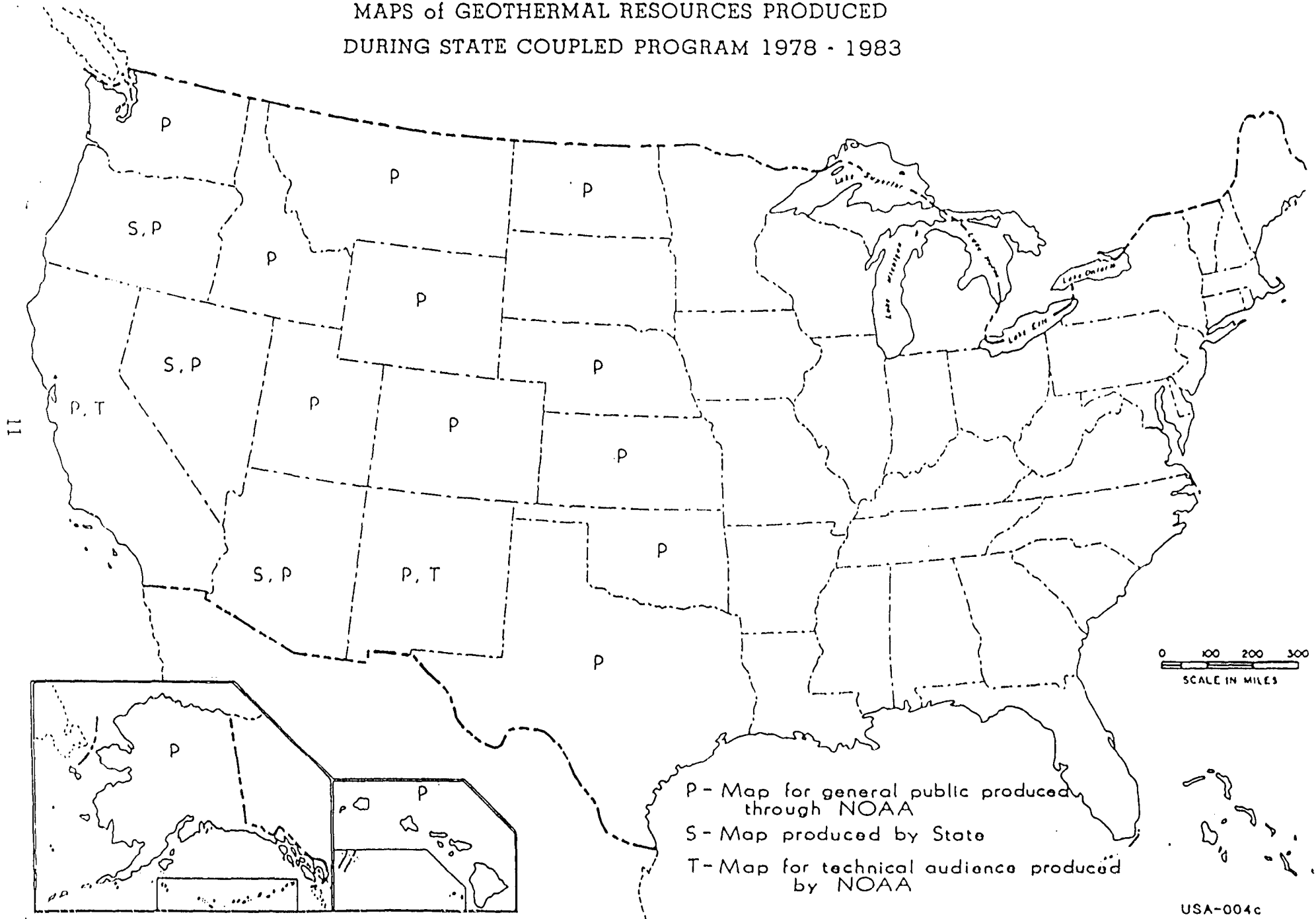
The National Oceanic and Atmospheric Administration facility at Boulder, Colorado, has been funded by DOE under the State Coupled Program to coordinate production of most of the maps. Their coordination tasks have included compilation of base data, production of proof maps for each state, and coordination with the Government Printing Office on final production of the maps.

Several states have coordinated production of their own individual maps; these are indicated on Figure 5. Quality control for the NOAA-produced maps has been accomplished through the participation of a map review committee, composed of representatives of DOE, the individual states, NOAA, the USGS, ESL/UURI and other support contractors. Generalized map design standards and data format, as well as individual map text and layout decisions have been handled by this committee, with ESL/UURI taking a lead role.

In addition to production of individual state maps, data compiled by State Coupled Program participants have been published in other maps. These

FIGURE 3

MAPS of GEOTHERMAL RESOURCES PRODUCED
DURING STATE COUPLED PROGRAM 1978 - 1983



have included a national map of geothermal resources coordinated by DOE Headquarters personnel, maps published in association with USGS Circular 790, and a map of geothermal resources published by National Geographic Magazine as part of a special issue on energy.

Utilization of Data

Data compiled by State Coupled Program resource assessment teams have been used by both private concerns and other federal programs. Much of the individual site data have been used by local developers, in promoting and developing geothermal resources. These have included large projects, such as district heating programs in Pagosa Springs, Colorado, and Boise, Idaho, and the heating of the Utah State Prison, as well as many smaller projects.

Other federal geothermal programs have been one of the prime beneficiaries of State Coupled Program data. These programs have included the State Commercialization Planning Program, the Federal Buildings Program, the User Coupled Confirmation Drilling Program, the Technology Transfer and Outreach Programs, the Energy Technology Program, the National Progress Monitor system, the geothermal PON and PRDA efforts of DOE, the National Market Shares Estimates Study, and the identification of resource conflicts between geothermal sites and proposed Forest Service and BLM wilderness study areas. All of these other programs have used both site data and state team interpretations of overall resource potential. Most of the coordination with these programs has been through the efforts of ESL/UURI and other support contractors, although some efforts, most notably the Commercialization Planning program, have been coordinated directly among respective teams in individual states.

Three projects of the USGS have benefited directly from the State Coupled Program. These are computer file GEOTHERM (the national repository for

geothermal data) and Circulars 790 and 892. Prior to the inception of the State Coupled Program, GEOTHERM had approximately 250 geothermal sites in its data base. At the present time, more than 6000 entries are included. Data in GEOTHERM include not only temperature and production flow rate for geothermal wells and springs, but also chemistry of thermal waters, and, where applicable, comments on development of the field. Circular 790 was undertaken in 1978 by the USGS, to assess geothermal resources with temperatures greater than 90°C. Cooler resources were discussed but not quantified. State teams participated in the assessment by providing resource data and assisting in the development of maps depicting the cooler resources. Circular 892 was published in 1983, and quantified the assessment of geothermal resources with temperatures less than 90°C. State team participation in this assessment included providing much new data. Efforts of state resource assessment teams on USGS projects were coordinated by ESL/UURI.

Several other smaller projects have used State Coupled Program data. Perhaps the most notable of these was by National Geographic magazine, which included a discussion and map of geothermal resources in a special issue on energy.

EARTH SCIENCE LABORATORY ROLE

During the State Coupled Program, ESL/UURI has been funded to perform a variety of tasks. These have included technical support to DOE at both Headquarters and Operations Office levels, including monitoring state programs in 16 western states, serving as interprogram liaison, technical support to states and publishing summary reports.

Support to DOE has primarily focused on technical portions of the State Coupled Program. ESL/UURI has aided DOE by communicating technical program

objectives to the state participants, through annual or more frequent visits to each state participant, in addition to phone calls and letters. ESL/UURI has also convened annual meetings of program participants, one in Glenwood Springs, Colorado, one in Seattle, Washington, and two in Salt Lake City. Proceedings of most of these meetings are available as ESL/UURI publications (Ruscetta and Foley, 1981a,b; Ruscetta, 1982a,b). Monitoring each state program has included following progress on individual tasks and coordinating with each state concerning content of proposals. ESL/UURI has also served as a technical reviewer for many reports published by individual states.

The State Coupled Program has had to interface with many DOE and other Federal geothermal programs; ESL/UURI has been active in acting as a liaison with all the programs listed earlier. The ESL/UURI role has been most active in coordination with the USGS resource assessments and the User Coupled Confirmation Drilling Program. ESL/UURI visited each of the states to explain the User Coupled Program. Major emphasis was also placed on wilderness land studies.

Many requests for talks summarizing geothermal resource occurrence and exploration have been received by ESL/UURI. State Coupled Program data were extensively relied upon in making these presentations.

ESL/UURI has also been active in supporting individual state efforts through providing technical expertise in geology, geochemistry and geophysics. Table 3 is a summary of some of these efforts. ESL/UURI also ran an exploration technology workshop at one of the meetings of State Coupled Program participants. Topics discussed at this meeting included gravity, magnetics, thermal gradients, electrical methods, trace element studies, geothermometry, drilling and reservoir testing. In addition, ESL conducted an intensive mercury technique workshop with personnel from the Colorado team.

TABLE 3

PARTIAL LIST OF ESL ANALYTIC SUPPORT

K-AR DATING - Montana
Oregon
Washington

GEOPHYSICS - Alaska - Electrical Studies
Arizona - Resistivity Data Modeling
California - Resistivity Data Modeling
Colorado - Resistivity Data Modeling
Idaho - Geophysical Data Package Development
Utah - Program Design, Data Interpretation, Gravity Program
Washington - Resistivity Modeling

GEOCHEMISTRY - California - Water Analyses
Oregon - Water Analyses
Utah - Water Analyses

HYDROLOGY - Utah - Aquifer Test Modeling

REFERENCES CITED

- Ruscetta, C. A., and Foley, D., eds., 1981a, Geothermal Direct Heat Program, Glenwood Springs technical conference proceedings, volume I, papers presented: Earth Science Laboratory Report 59, 313 p.
- Ruscetta, C. A., and Foley, D., eds., 1981b, Geothermal Direct Heat Program, Glenwood Springs technical conference proceedings, volume II, bibliography of publications: Earth Science Laboratory Report 60, 39 p.
- Ruscetta, C. A., ed., 1982a, Geothermal Direct Heat Program roundup technical conference proceedings, volume I, papers presented: Earth Science Laboratory Report 98, 312 p.
- Ruscetta, C. A., ed., 1982b, Geothermal Direct Heat Program roundup technical conference proceedings, volume II, bibliography of publications: Earth Science Laboratory Report 99, 64 p.

APPENDIX I

STATE COUPLED PROGRAM LIST OF PARTICIPANTS

DOE-Headquarters, DOE-Idaho Operations, DOE-San Francisco Operations and DOE-Nevada Operations personnel have been involved in program management of the State Coupled Program.

STATE TEAMS

ALABAMA	Geological Survey of Alabama P.O. Drawer 0 University, AL 35486
ALASKA	Geophysical Institute University of Alaska Fairbanks, AK 99701 Alaska Div. of Geological and Geophysical Surveys 794 University Ave., Basement Fairbanks, AK 99701
ARIZONA	Arizona Bureau of Geology and Mineral Technology 845 N. Park Ave. Tucson, AZ 85719
CALIFORNIA	California Division of Mines and Geology 1416 Ninth St., RM 1341 Sacramento, CA 95816
COLORADO	Colorado Geological Survey 1313 Sherman Ave., RM 715 Denver, CO 80203
DELAWARE	Delaware Geological Survey University of Delaware Newark, DE 19711
HAWAII	Hawaii Institute of Geophysics University of Hawaii 2525 Correa Rd. Honolulu, HI 96822

IDAHO	Idaho Department of Water Resources Statehouse Boise, ID 83702
KANSAS	Kansas Geological Survey University of Kansas Lawrence, KS 66044
MASSACHUSETTS	Amherst College Department of Geology Amherst, MA 01002
MISSISSIPPI	Mississippi Geologic, Economic and Topographic Survey P.O. Box 4915 Jackson, MS 39216
MONTANA	Montana Bureau of Mines and Geology Butte, Montana 59701
NEBRASKA	Nebraska Geological Survey University of Nebraska 304 Administration Building Lincoln, NE 68588
NEVADA	University of Nevada-Las Vegas Earth Sciences Division 255 Bell St., Suite 200 Reno, NV 89503
NEW MEXICO	New Mexico Energy Institute Box 3-EI New Mexico State University Las Cruces, NM 88003
NEW YORK	New York State Energy Research & Development Agency Bldg. No. 2 Rockefeller Plaza Albany, NY 12223
NORTH DAKOTA	North Dakota Geological Survey Grand Forks, ND 58202
OKLAHOMA	Oklahoma Geological Survey University of Oklahoma 830 S. Van Vleet Oval, Rm. 163 Norman, OK 73019

OREGON Oregon Dept. of Geology and
Mineral Industries
1005 State Office Bldg.
Portland, OR 97201

TENNESSEE Institute for Energy Analysis
P.O. Box 117
Oak Ridge, TN 37830

TEXAS Texas Bureau of Economic Geology
University Station, Box X
Austin, TX 78712

Dept. of Geological Science
University of Texas
El Paso, TX 79968

UTAH Utah Geological and Mineral
Survey
606 Black Hawk Way
Salt Lake City, UT 84108

WASHINGTON Division of Geology and Earth
Resources
Washington Dept. of Natural Resources
Mail Stop PY 12
Olympia, WA 98504

WYOMING Department of Geology
University of Wyoming
Laramie, WY 82071

ASSOCIATED GROUPS:

LANL Geological Applications Group G-9
Los Alamos National Laboratory
P.O. Box 1663
Los Alamos, NM 87545

NOAA National Oceanic and
Atmospheric Administration
Code D64/NOAA/EDIS
325 Broadway
Boulder, CO 80302

GRUY FEDERAL Gruy Federal
2001 Jefferson Davis Hwy.
Arlington, VA 22202

USGS U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

ESL/UURI

Earth Science Laboratory/
University of Utah Research Institute
420 Chipeta Way, Suite 120
Salt Lake City, UT 84108

APPENDIX II - SITE LIST

This is a list of selected sites investigated by State Coupled Program resource assessment teams, 1978-1983. Major investigations are included; reconnaissance investigations of individual springs are not listed. For information about a particular site in a state, contact the agency listed in Appendix I.

ALASKA

Sites

- Akutan
- Chena
- Circle
- Copper River Basin
- Manley
- Pilgrim
- Tenakee
- Unalaska
- Willow

Regional Surveys

- Aleutians
- Southeast Alaska
- Seward Peninsula

ARIZONA

Sites

- Avra Valley
- Big Sandy Valley
- Bowie
- Buena Vista
- Castle Hot Springs
- Cactus Flat
- Clifton Hot Springs
- Coolidge
- Harquahala-Tonopah
- Hassayampa Plain
- Hyder
- Paloma Plain
- Papago Farms
- Safford Basin
- San Bernardino Valley
- San Francisco River

ARIZONA, continued

San Manuel
San Pedro River
San Simon
Scottsdale
Springerville-Alpine
Tucson
Verde Valley
Willcox
Yuma

CALIFORNIA

Sites

Bridgeport
Calistoga
Geysers
Los Angeles
Paso Robles
San Bernardino
Sonoma Valley
Ukiah

General publication on 40 additional sites

COLORADO

Sites

Alamosa
Animas Valley
Canon City
Hartsell
Hot Sulphur Springs
Idaho Springs
Ouray
Pagosa Springs
Ranger
Shaw Springs
Steamboat-Routt Springs
Waunita

HAWAII

Islands

Hawaii
Maui
Ohau

IDAHO

Sites

Boise
Nampa-Caldwell
Pocatello-Tyhee
Wood River
Weiser

Regional study of eastern and southeastern Idaho

KANSAS

Statewide data compilation only

MONTANA

Sites

Bozeman
Centennial Valley
Deer Lodge Valley
Ennis
Helena
Hot Springs
Little Bitterroot Valley
Madison Valley
Norris
Radersberg
Warm Springs
West Yellowstone
White Sulphur Springs

NEBRASKA

Only regional reports

NEVADA

Sites

Big Smoky Valley
Caliente
Carlin
Carson City-Eagle Valley
Carson Sink
Fallon
Golconda
Hawthorne
Kane Springs
Moana
Paradise Valley
Pumpnickel Valley

NEW ENGLAND

Primarily regional study

NEW MEXICO

Sites

Albuquerque
Animas Valley-Lighting Dock
Black Range
Chamberino
Columbus
Las Cruces
Mesquite
Portillo Mountain
Tularosa Basin
Socorro
Truth or Consequences

County studies

NEW YORK

Areas

Capital district
Lebanon Springs
Saratoga Springs

Regional study of western and central New York

NORTH DAKOTA

Regional studies only

OKLAHOMA

Regional studies only

OREGON

Sites

Alvord Desert
Ashland
Belknap-Foley
Breitenbush Hot Springs
Burns
Corbett-Moffett
Glass Buttes
Harney Basin
Lakeview
McDermitt

OREGON, continued

Milton-Freewater
Mount Hood
Parkdale-Hood River

Powell Buttes
Vale-Ontario
Walla Walla
Wilamette Pass

Regional studies of Cascade Range

TEXAS

Areas

Austin
Hueco Bolson
Marlin
Presidio Bolson
San Antonio

Regional study of Balcones Fault Zone

UTAH

Sites

Cache Valley
Crystal Hot Springs
Crystal-Madsens Hot Spring
Escalante Desert
Jordan Valley
Little Mountain
Locomotive Springs
Midway
Udy Hot Springs
Utah Hot Springs
Utah Valley
Warm Springs Fault

WASHINGTON

Sites

Camas
Moses Lake
Mount Saint Helens
North Bonneville
Walla Walla
White Pass
Wind River

Regional studies in the Cascades

WYOMING

Sites

Cody
Thermopolis

Basins

Great Divide-Washakie
Green River
Hanna
Laramie
Powder River
Shirley
Wind River

PROGRAM JUSTIFICATION

Until the recent energy crisis there has been very little interest in direct uses of geothermal energy. Therefore, little geothermal exploration has been done to date. Present data indicate that the total geothermal resource base in the U.S. is very large (U. S. Geological Survey Circular 790 -- Assessment of United States Geothermal Resources - 1978). Many geothermal resources remain to be discovered and developed.

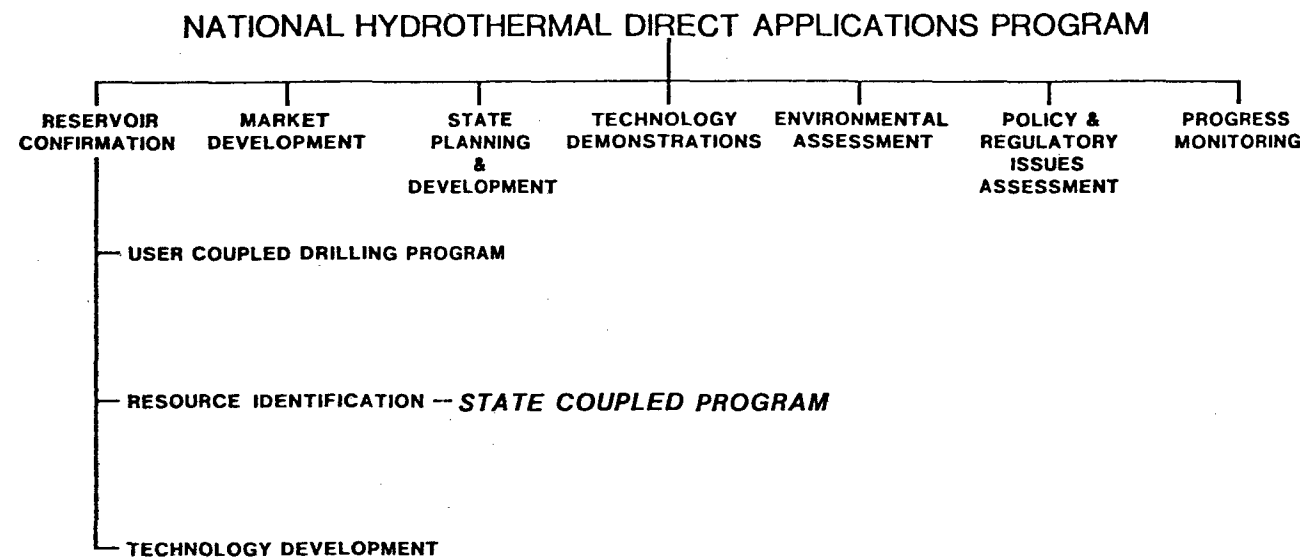
OBJECTIVE

The objective of DOE's State Coupled Program is IDENTIFICATION OF GEOTHERMAL RESOURCE AREAS. The data generated by this program are:

1. Published as maps and reports for the benefit of prospective users, and;
2. Transmitted to the U. S. Geological Survey for their analysis in assessing geothermal resources in the United States.

RELATIONSHIP TO NATIONAL DIRECT APPLICATIONS PROGRAM

The State Coupled Program is an integral component of the



State Resource Teams work closely with State Commercialization Planning Teams, whose job is to facilitate development of geothermal resources (under State Planning and Development).

PHASE I
(IMMEDIATE PRIORITY)

DIRECT DETECTION OF THERMAL WATERS IS EMPHASIZED

Direct detection is quick and inexpensive. Simple techniques such as analyzing available temperature data and collecting new temperature data from springs and wells are effective in discovering resources. Many reported temperature measurements are inaccurate. Many wells lack measured temperature.

BASIC TASKS ARE:

- Compilation of Available Data & New Measurements
 - temperature of springs
 - temperature in wells
 - temperature gradients
 - water quality
 - aquifer productivity
 - related geology
- Publication of Maps & Reports
 - for use by the general public
 - to facilitate geothermal development

PHASE II
(SUBSEQUENT PRIORITY)

INDIRECT DETECTION OF THERMAL WATERS IS EMPHASIZED

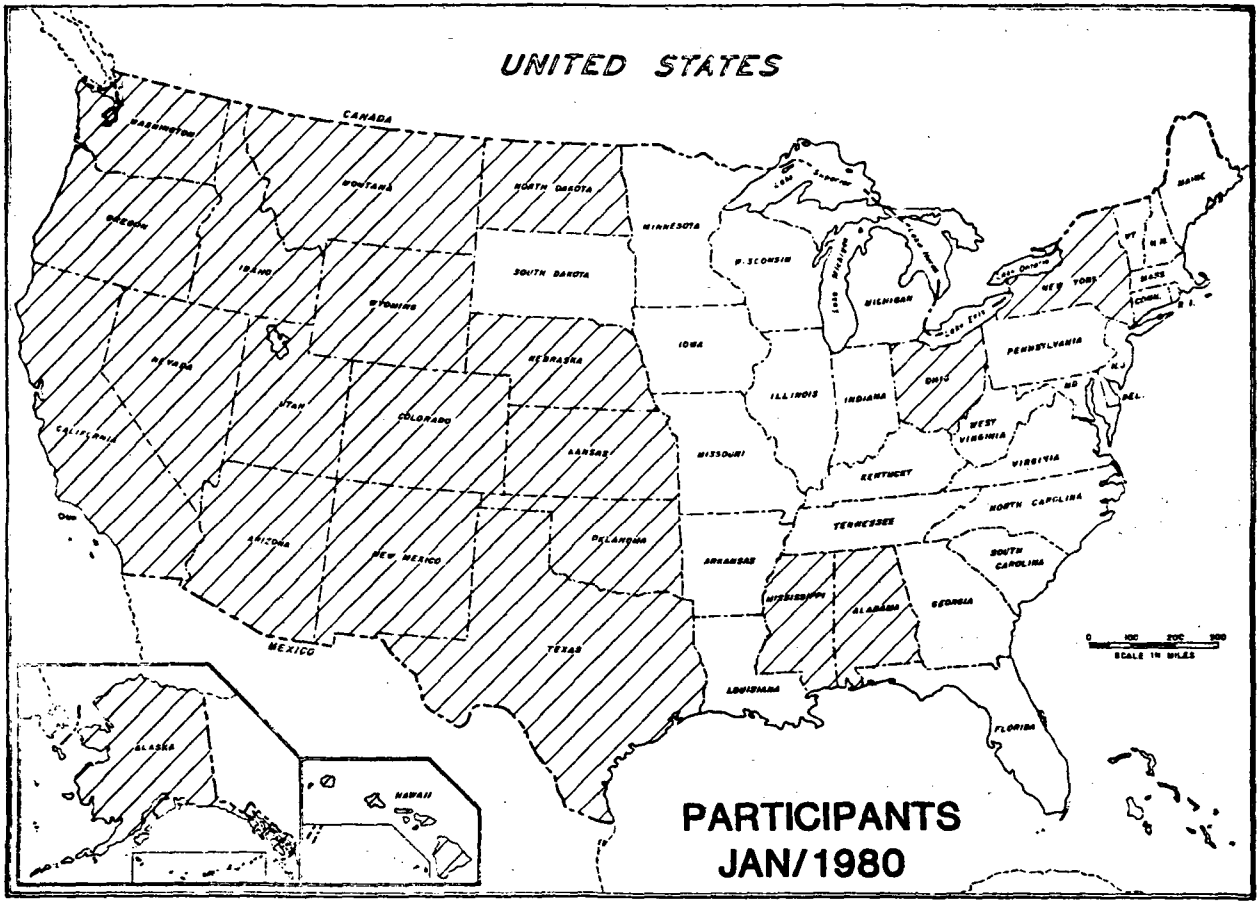
Indirect detection is more expensive and more risky. Although indirect indicators are needed to find hidden resources, exploration for hidden resources is pursued only after direct detection of more obvious resources is substantially complete.

BASIC TASKS ARE:

- Performance & Analysis (as appropriate)
 - heat flow
 - chemical geothermometry
 - geology
 - geophysics
 - geochemistry
 - hydrology
- Publication of Maps & Reports
 - for use by the general public and by earth scientists
 - to facilitate geothermal development.

THE STATE COUPLED PROGRAM

LOW-AND MODERATE-TEMPERATURE GEOTHERMAL RESOURCES

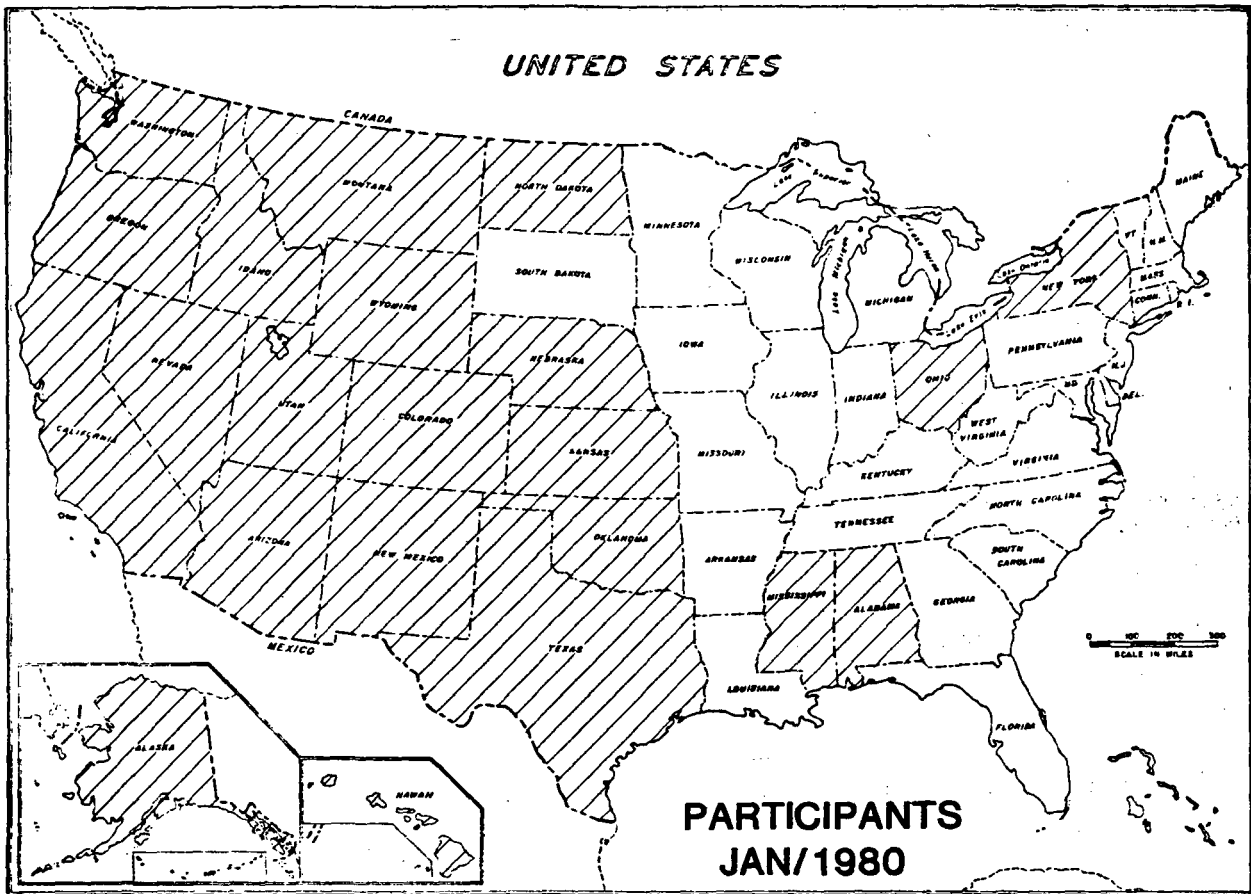


U.S. DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY



THE STATE COUPLED PROGRAM

LOW-AND MODERATE-TEMPERATURE GEOHERMAL RESOURCES

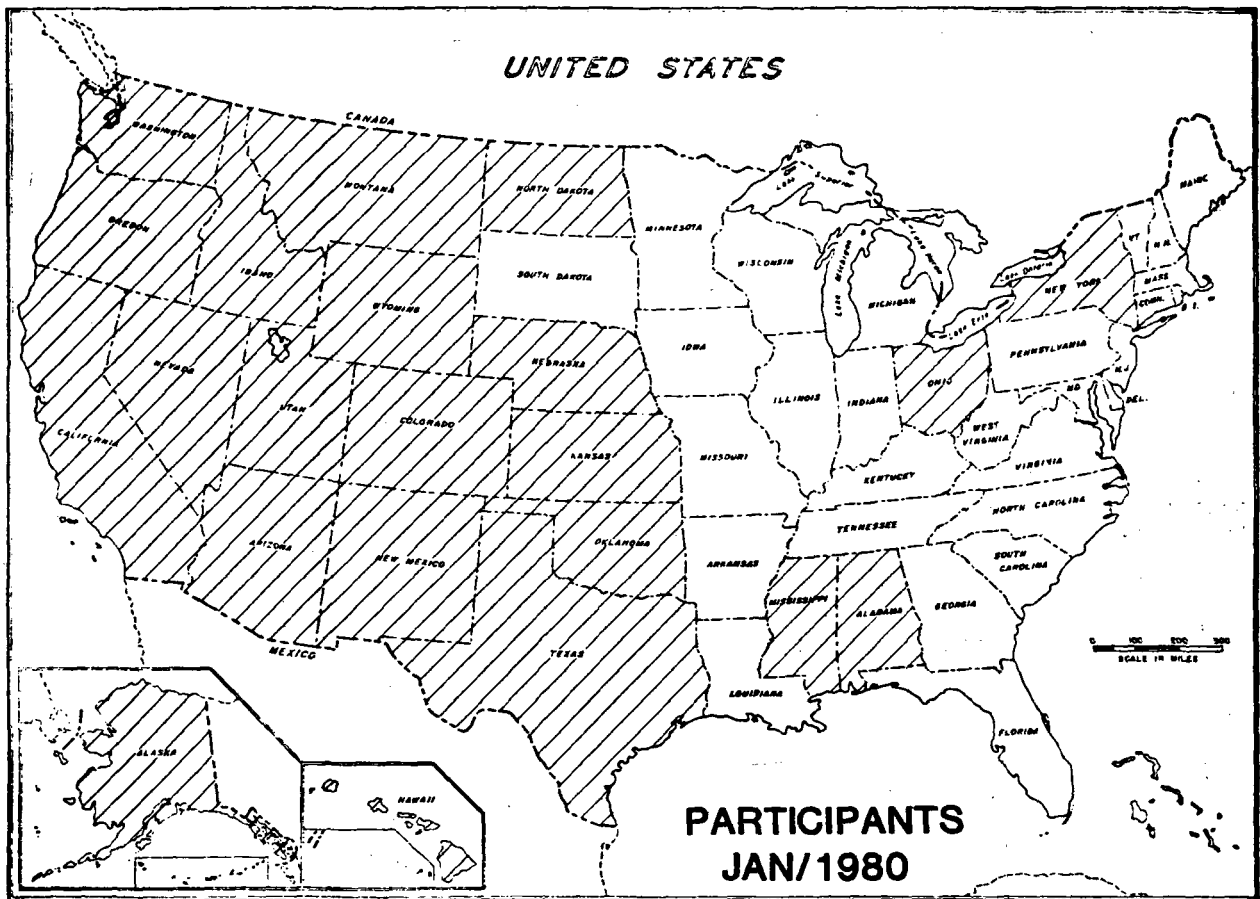


U.S. DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY



THE STATE COUPLED PROGRAM

LOW-AND MODERATE-TEMPERATURE GEOHERMAL RESOURCES

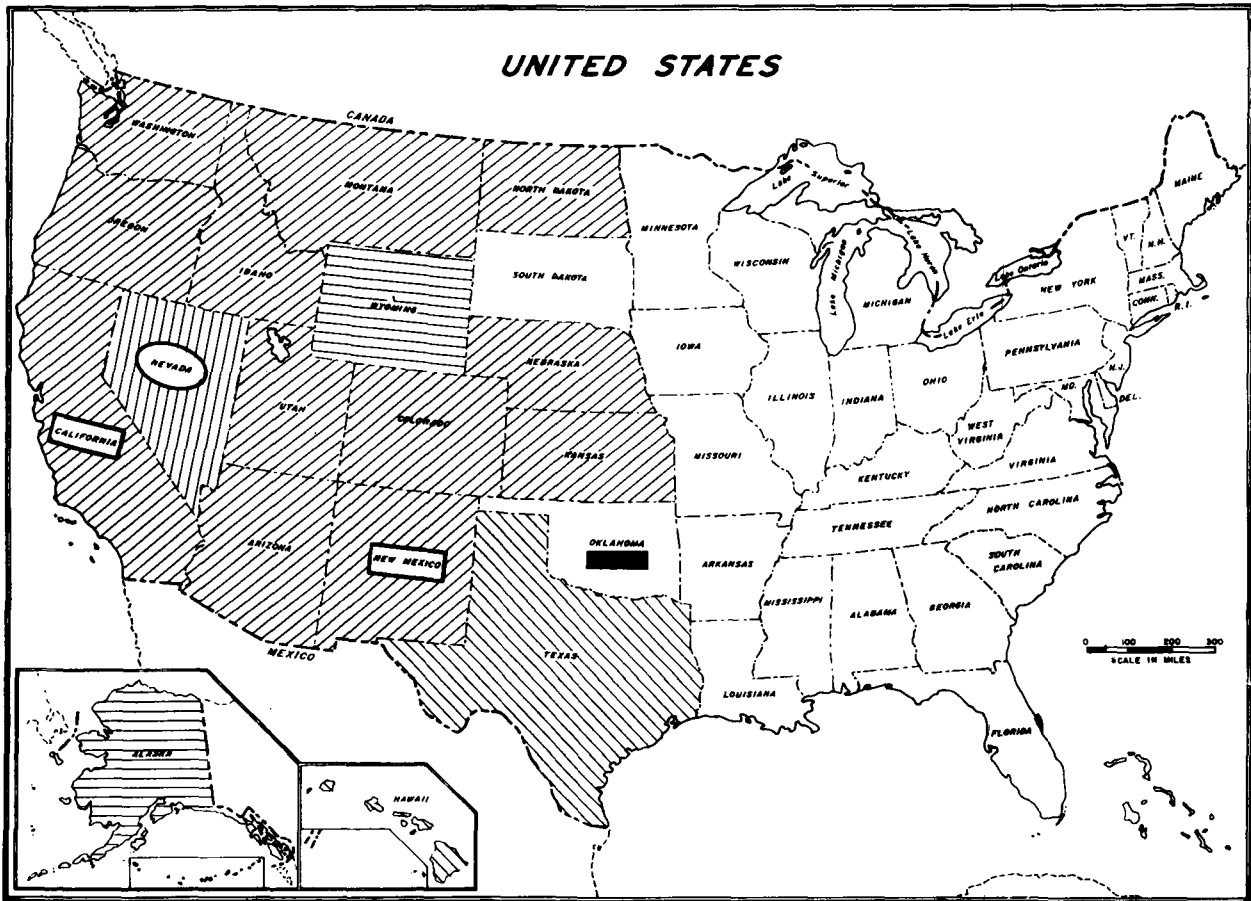


U.S. DEPARTMENT OF ENERGY
DIVISION OF GEOTHERMAL ENERGY



STATE COUPLED PROGRAM MAP STATUS

DECEMBER 1982



- User Map Published or in press (NOAA)
- State Printed Map
- User Proof in Review
- User Map in preparation
- Update in preparation
- Technical Map in Production
- Other Map Through State Program

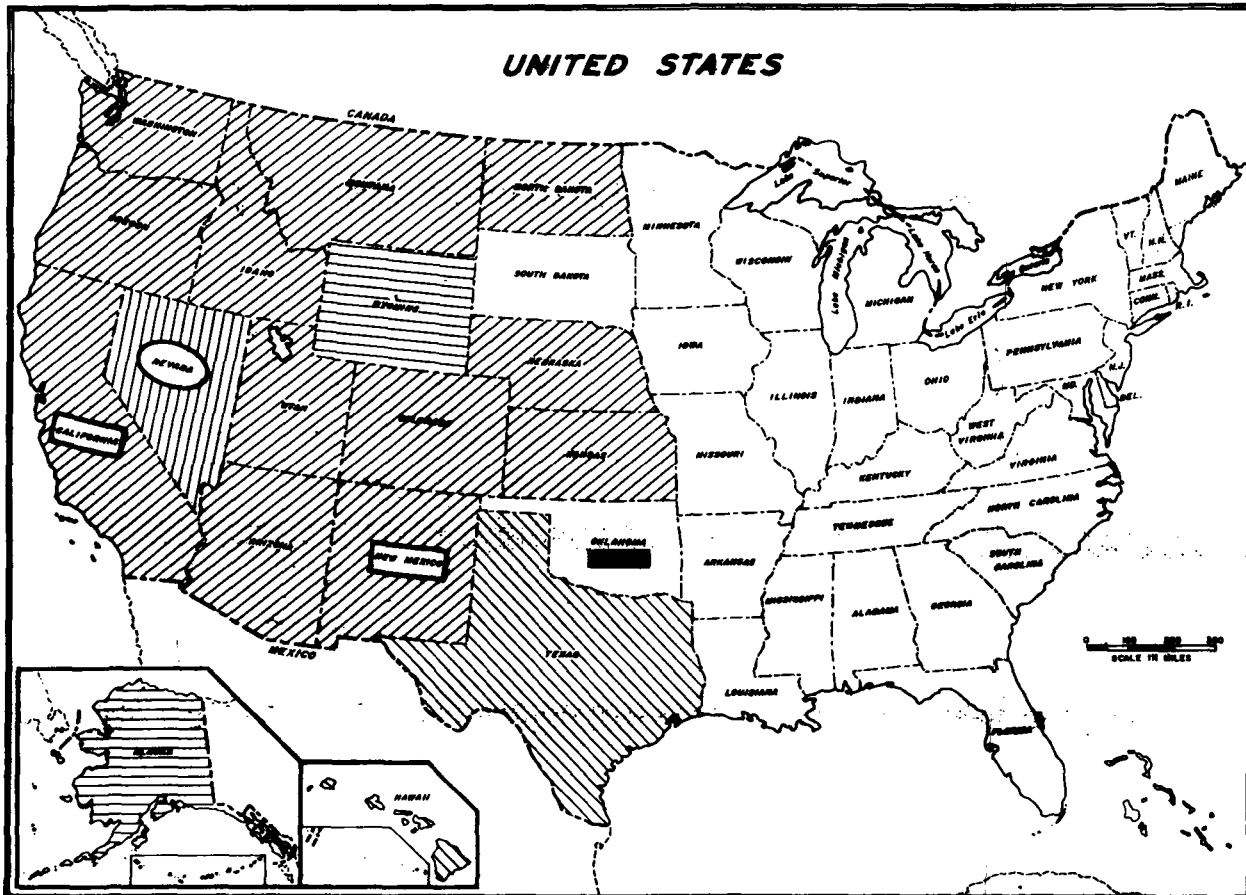









SC-046

Revised Dec/82

STATE COUPLED PROGRAM MAP STATUS

DECEMBER 1982



-  User Map Published or in press (NOAA)
-  State Printed Map
-  User Proof in Review
-  User Map in preparation
-  Update in preparation
-  Technical Map in Production
-  Other Map Through State Program



SC-046

Revised Dec/82

Carl

UNIVERSITY OF UTAH RESEARCH INSTITUTE

UURI

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SALT LAKE CITY, UTAH 84108
TELEPHONE 801-581-5283

MEMORANDUM

April 2, 1982

TO: ESL Technical Staff
FROM: Carl Ruscetta
SUBJECT: Final Technical Conference
State Coupled Geothermal RA Program

Attached you will find an agenda for the subject conference, which will be held April 5-7 at the Marriott Hotel here in Salt Lake. You are invited to attend any of these sessions and the luncheon and banquet meetings scheduled.

If you wish to attend the banquet on Tuesday, April 6, the charge will be \$20.00 per person. Prime Rib of Beef will be served. Mr. James Bresee, DOE Washington, will be the featured speaker at the banquet and will talk about future trends in the energy picture. You must let me know by 4:00pm today, April 2, if you are planning to attend this banquet.

Note that the luncheon on Wednesday, April 7, will be a joint meeting with the GRC Basin and Range Section. John Sass of USGS, Flagstaff, AZ will be the featured speaker. The charge for this luncheon will be \$10.00 per person and again I must know if you plan to attend by 4:00pm today.

Please see me for tickets to both the banquet and luncheon meetings.



CAR:gm

enclosures

AGENDA

State Coupled Resource Assessment Roundup Conference
Marriott Hotel, Salt Lake City, Utah
April 5-7, 1982

Monday, April 5, 1982

- 1:00-5:00 P.M. State Team Contract and Deliverables Review.
(By arrangement)
- 7:00-9:00 Bienvenue at the Marriott Hotel, Salon F.

Tuesday, April 6, 1982

- 7:30 A.M. Registration and Convocation, Salons G and H.
- 8:30 The DOE Geothermal RA Program - Retrospective and Corollary. Jim Bresee, DOE Washington, D.C., Susan Prestwich, Idaho Operations Office (and possible comments from special guests Roy Mink and Clay Nichols).
- 9:15 Alaska: Roman Motyka; "Thermal Fluid Geochemistry of the Makushin and Akutan Geothermal Prospects."
- 9:40 Tennessee: Charles Whittle; "Geothermal Resources in Tennessee."
- 10:05 Break
- 10:20 Washington: Eric Schuster; "Geothermal Resources of the Columbia River Basin."
- 10:45 Oregon: George Priest; "Geological Framework of Hydrothermal Systems in the Oregon Cascades."
- 11:10 Idaho: Dale Ralston; "Geothermal Resource Assessment in Southeast Idaho."
- 11:35 Massachusetts: Gerry Brophy; Topic to be announced.
- 12:00 P.M. Lunch Break: Enjoy beautiful downtown Salt Lake.
- 1:15 Miscellaneous announcements and introduction to this afternoon sessions.
- 1:25 Arizona: Jim Witcher; "Heat Flow Drilling at Safford, Arizona."
- 1:50 New Mexico: Larry Icerman; "Program Accomplishments and Future Prospects for Low Temperature Geothermal Resource Assessment in New Mexico."

Agenda (Cont'd)
Tuesday, April 6 (Cont'd)

- 2:15 P.M. Utah: Robert Klauk; "Geothermal Reconnaissance of a Portion of the Escalante Valley, Utah."
- 2:40 Break
- 3:05 Colorado: Kevin McCarthy; "Helium and Ground Temperature Surveys at Steamboat Springs, CO."
- 3:30 Mike Wright; "Progress Report on Related DOE Geothermal Programs."
- 4:15 Summary and Adjourn
- 7:00 Banquet in the Brighton Room. Featured speaker: James Bresee, DOE Washington, D.C.

Wednesday, April 7, 1982

- 8:15 A.M. Reconvoation and Introduction
- 8:30 Montana: Charles Wideman; "Deer Lodge Valley Investigations."
- 8:55 North Dakota: Brad Wartman; "An Evaluation of the Geothermal Resources of North Dakota. Summary and Concluding Phase of the Program."
- 9:20 Wyoming: Henry Heasler; "Heat Flow Studies in Wyoming."
- 9:45 Nebraska: William Gosnold; "Three Years of Geothermal Resource Assessment Work in Nebraska."
- 10:10 Break
- 10:30 Kansas: Don Steeples; "Summary of the Kansas Geothermal Resource Assessment Program."
- 10:55 Oklahoma: Ken Luza; "A Summary of Geothermal Resource Assessment in Oklahoma."
- 11:20 Texas (TENRAC): Rob Roy; "Results of Hueco Tanks Texas/New Mexico Drilling Project."
- 11:45 Luncheon: Canyon Ballroom. Joint meeting with the Basin and Range Section of the GRC. John Sass, USGS, Flagstaff, Arizona; "Regional Heat Flow Studies in the Western U.S."
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Wednesday, April 7 (Cont'd)

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| 2:20 | Gruy Federal: Joel Renner; "Summary of Geothermal Prospects in the Eastern United States." |
| 2:45 | OIT: Gene Culver; "Aspects of Geothermal Energy Utilization." |
| 3:10 | Break |
| 3:25 | Marshall Reed, USGS, Menlo Park, California; "Quantitative Estimates of the Low-Temperature Geothermal Resource Inventory." |
| 3:50 | Summary, Open Discussion and Dispersion |
| Evening | Optional session to be announced |

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State Coupled Program Phone List
STATE RESOURCE AND ASSESSMENT TEAMS BY STATE

ALABAMA	Gary V. Wilson Geological Survey of Alabama P.O. Drawer 0 University, AL 35486	205-349-2852
ALASKA	Eugene Wescott Geophysical Institute University of Alaska Fairbanks, AK 99701	907-479-7576 FTS 399-0150
	Roman Motyka Alaska Div. of Geological and Geophysical Surveys 3001 Porcupine Drive Anchorage, AK 99501	907-479-7147
	Ross G. Schaff Alaska Div. of Geological and Geophysical Surveys 3001 Porcupine Drive Anchorage, AK 99501	907-277-6615
ARIZONA	Claudia Stone Geothermal Group Arizona Bureau of Geology and Mineral Technology 2045 N. Forbes Blvd. Tucson, Arizona 85719	602-626-4391
CALIFORNIA	Roger C. Martin, Forrest Bacon California Division of Mines and Geology 1416 Ninth St., RM 1341 Sacramento, CA 95814	916-322-9918
COLORADO	Richard H. Pearl Colorado Geological Survey 1313 Sherman Ave., RM 715 Denver, CO 80203	303-866-2611
HAWAII	Charles E. Helsley, Donald Thomas Hawaii Institute of Geophysics University of Hawaii 2525 Correa Rd. Honolulu, HI 96822	808-948-6482 FTS 556-0220

IDAHO	John C. Mitchell, Frank Sherman Idaho Department of Water Resources Statehouse Boise, Idaho 83702	208-334-4480
KANSAS	Don W. Steeples Kansas Geological Survey University of Kansas Lawrence, KS 66044	913-864-4991
MASSACHUSETTS	Gerry Brophy Amherst College Department of Geology Amherst, Massachusetts 01002	413-542-2233
MISSISSIPPI	Alvin R. Bicker P.O. Box 5348 Jackson, MS 39216	601-354-6228
MONTANA	John Sonderegger Montana Bureau of Mines and Geology Butte, Montana 59701	406-496-4159
NEBRASKA	William D. Gosnold Dept. of Geography-Geology University of Nebraska Omaha, 68132	402-554-2457
	Duane A. Eversoll Nebraska Geological Survey University of Nebraska Lincoln, NE 68588	402-472-3471 FTS 622-3471
NEVADA	Dennis Trexler University of Nevada Earth Sciences Division 255 Bell St. Suite 200 Reno, Nevada 89503	702-784-6151
NEW MEXICO	Chandler A. Swanberg New Mexico State University Physics Department Las Cruces, NM 88001	505-646-1920

NEW YORK	Burton Krakow New York State Energy Research & Development Agency Bldg. No. 2 Rockefeller Plaza Albany, NY 12223	518-465-6251
	James R. Dunn Dunn Geoscience 5 Northway Lane N. Latham, NY 12110	518-783-8102
NORTH DAKOTA	Kenneth L. Harris North Dakota Geological Survey Grand Forks, ND 58202	701-777-2231
OHIO	John Gray Ohio Geological Survey Fountain Square Columbus, OH 43224	614-466-5344
OKLAHOMA	William F. Harrison Ken Luza Oklahoma Geological Survey University of Oklahoma 830 S. Oval Norman, OK 73019	405-325-3032
OREGON	Donald A. Hull, George Priest Oregon Dept. of Geology and Mineral Industries 1005 State Office Bldg. Portland, OR 97201	503-229-5580
TEXAS	Charles M. Woodruff Texas Bureau of Economic Geology University Station, Box X Austin, TX 78712	512-471-1534
	Dr. C. D. Rau Texas Energy and Natural Resources Advisory Council 200 E. 18th St. Austin, TX 78701	512-475-5588
	Dr. Robert F. Roy Dept. of Geological Science University of Texas El Paso, TX 79968	915-747-5424

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Olympia, WA 98504

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Department of Geology
University of Wyoming
Laramie, WY 82071

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National Oceanic and FTS 320-6124
Atmospheric Administration
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Arlington, VA 22202

USGS Marshall Reed 202-376-4914
USGS
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Menlo Park, CA 94025

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	David Lombard Forrestal Building Room 6B025, CE-524 1000 Independence Ave., S.W. Washington, D.C. 20585	202-252-8070
EG&G IDAHO (Commerciali- zation)	Bill Toth EG&G Idaho, Inc. P.O. Box 1625 Idaho Falls, ID 83415	208-526-1801
UURI	Duncan Foley Carl Ruscetta Earth Science Lab/UURI 420 Chipeta Way, Suite 120 Salt Lake City, UT 84108	801-581-5283
VPI	John Costain Dept. of Geology Virginia Polytechnic Institute Blacksburg, VA 24061	703-961-6521

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STATE: _____

ORGANIZATION: _____ PHONE: _____

PRINCIPAL INVESTIGATOR/CONTACT: _____

CONTRACT NO.: _____ DATE: _____

EST. COMPLETION: _____ ORIGINAL AMOUNT OBLIGATED DOE: _____

CONTRACTOR: _____

TOTAL: _____

MODIFICATIONS:

<u>NUMBER</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>DOE</u>	<u>AMOUNT</u>	<u>CONTRACTOR</u>

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SUMMARY OF DE'

STATUS

DESCRIPTION

TASK NO.

DATE RECEIVED

<u>DESCRIPTION</u>	<u>TASK NO.</u>	<u>DATE RECEIVED</u>

MASTER
PAGE 1

COMMENTS AND ACTION ITEMS:

STATE _____ CONTRACT NO. _____

SUMMARY OF GOVERNMENT EQUIPMENT ACQUIRED

STATE COUPLED RESOURCE ASSESSMENT PROGRAM

DESCRIPTION

DATE ACQUIRED

EST. COST

REMARKS

MASTER
Gov. EQUIPMENT

UURI

EARTH SCIENCE LABORATORY
420 CHIPETA WAY, SUITE 120
SALT LAKE CITY, UTAH 84108
TELEPHONE 801-581-5283

January 10, 1983

MEMORANDUM

TO: Susan Prestwich
FROM: Duncan Foley
SUBJECT: Attached RFP suggestions

I have written the accompanying brief text as a first preliminary suggestion for what you and Chuck might like to say if the RFP on the State Coupled Program comes out. Some of the unanswered questions are:

1. Should the duration of the contracts be for more than one year? I think not, particularly given the time extensions that most states are requesting.
2. Who is eligible to respond? National Labs? Blackwell at SMU? USGS?
3. I have put in a statement that publication of previous work should not be allowed; is this reasonable? My fear here is that we could see most of the money go for work for which the state teams have either already been funded or for which they have been given credit on a cost share.
4. I have not put in any words about a cost share. What does Chuck want under this administration?
5. As we get to future generations of this document, we will of course have to check with the legal beagles, to verify how much we can target the statements to existing teams.

I will call you once we have sent the telecopy, with more questions and thoughts.


Duncan Foley

In the past several years, the Department of Energy has had ongoing programs in most western and many eastern states to assess, through the application of geological, geochemical, geophysical, and hydrologic techniques, low- and moderate-temperature geothermal resources. The program has been managed by the Division of Geothermal and Hydropower Technologies in Washington, D.C., with major support from DOE field offices in Idaho Falls, San Francisco and Las Vegas. DOE has contracted with individual state agencies, usually geological surveys or universities, to perform the actual assessment. DOE has also contracted with several other organizations for technical support to the program.

The goals of DOE in the State Coupled Program have been to develop geological, geochemical, geophysical, and in some cases, hydrologic data bases relevant to the study of low- and moderate-temperature geothermal resources within each state. These data have been compiled through two major types of studies. The first type has been the compilation of state-wide data, such as thermal springs and wells. The second has been through regional studies, in order to define the best prospective areas for private sector geothermal exploration. Throughout the State Coupled Program, compiled data has been submitted to the U. S. Geological Survey to support their national efforts in geothermal resource assessment.

This RFP is designed to solicit proposals from qualified organizations, in order to supplement the tasks accomplished to date under the State Coupled Program. New geological, geochemical, geophysical, or hydrologic data will be compiled, in order to expand upon existing knowledge about the nature and occurrence of low- and moderate-temperature geothermal resources in the states where funding is awarded.

It is anticipated that preference will be given to state organizations who have participated in the State Coupled Program in the past. In exceptional circumstances, however, proposals might be considered from other organizations where the principal professionals of that organization have extensive experience in state agency low- and moderate-temperature geothermal resource assessment, and where the non-state organization can clearly demonstrate the required expertise to accomplish the tasks in a timely manner.

DOE does not feel it necessary to fund studies in each state from which proposals might be received. Preference will be given to those states with proven low- and moderate-temperature geothermal resources. DOE also

anticipates that funding awards will be made at different levels for different states.

Tasks that could be proposed under this RFP include:

1. Compilation of new statewide data bases. These data should compliment geological, geochemical, geophysical, or hydrologic data already gathered by federally funded geothermal resource programs.
2. Compilation of new data to add to existing statewide geological, geochemical, geophysical, or hydrologic information. For example, chemical analyses of newly discovered thermal waters could be performed. Such new data should be closely integrated with existing information.
3. Development of additional geological, geochemical, geophysical, or hydrologic data, to supplement those data already compiled as part of area studies. These data could be used to refine target models for geothermal resources developed under existing portions of the State Coupled Program.
4. Existing area studies could be expanded by extending their geographic limits. Such new geoscientific data would allow refinement of resource target models.
5. New areas could be selected for study, with the goal of developing a geological, geochemical, geophysical, and hydrologic data package similar to those already existing in other area studies in a state.
6. Existing data in a state could be re-evaluated in light of new or modified geothermal resource target models. Significant advances have recently taken place in the understanding of low- and moderate-temperature geothermal resources, which could be applied to reinterpretation of existing data bases. This type of study would allow the development of suggestions for the occurrence of additional resources in known areas and new resources in presently unknown areas.
7. In exceptional cases, should an award be made to a previous participant in the program, a small portion of the funding could be applied to the continuation of on-going tasks, where such additional work on the task will clearly benefit the goals of DOE. Such funding would not include monies to publish already completed reports.

Proposals do not need to include all of these tasks, but may emphasize

those most relevant to a particular state. DOE will not fund tasks that duplicate existing data.

Deliverables under this RFP would be negotiated with each funded organization, in light of the appropriate products for the proposed tasks. It is presently anticipated that monthly progress as well as final technical reports will be required.

The primary criteria for selection of agencies to be funded will be the appropriateness of proposed tasks in expanding knowledge about low- and moderate-temperature geothermal resources in a state. The geothermal potential of a state, and the ability of the funded agency or group to perform the work in a timely, cost-effective manner will also be considered.

DOE STATE COUPLED PROGRAM
 LOW-TEMPERATURE GEOTHERMAL RESOURCE ASSESSMENT
 CONTRACT STATUS OCTOBER 31, 1982

STATE	AGENCY	CONTRACT NUMBER	SCHEDULED COMPLETION	STATUS 10/31/82
(A) Completed Contracts				
Alaska	Geophys. Institute	DE-AS07-781D-1720	12/31/79	Completed 9/82
Alaska	Geophys. Institute	DE-FC07-79ET27034	4/15/82	Completed 8/82
North Dakota	University Of,	DE-FC07-791D12030	5/1/82	Completed 8/82 *
Oregon	State Of,	DE-FC07-79ET27220	5/1/82	Completed 7/82
(B) Completed Contracts				
Arizona	State Of,	DE-FC07-791D42009	6/30/82	Final Report Review
Colorado	Geological Survey	DE-AS07-77ET28365	12/31/82	Report Prep.
Idaho	Dept. Water Resources	DE-AS07-77ET28407	12/131/82	Report Prep.
Kansas	Geological Survey	DE-AS07-79ET27204	9/20/82	Final Report Review
New Mexico	NM State University	DE-AS07-781D01717	12/31/82	Report Prep.
Oklahoma	University Of,	DE-AS07-801D12172	12/31/82	Report Prep.
Texas	Southern Methodist U.	DE-AS07-791D12037	8/31/82	Report Prep.
Texas	TENRAC	DE-FC07-791D12080	11/30/82	Report Prep.
(C) Contracts Scheduled for Completion in 1983				
Alaska	State Of,	DE-FC07-79ET27105	1/15/83	---
Massachusetts	Amherst College	DE-FC07-80RA50272	1/1/83	---
Montana	University Of,	DE-FC07-791D12033	9/30/83	---
Nebraska	University Of,	DE-AS07-79ET27205	3/31/83	---
Oregon	State Of, (Cascades)	DE-FC07-791D12044	9/30/83	---
Texas	Bu. Econ. Geology	DE-AS07-791D12057	2/28/83	---
Utah	Geological Survey	DE-AS07-77ET28393	3/31/83	---
Washington	State Of,	DE-AC07-79ET27014	7/31/83 11/31/83	---
Wyoming	University Of,	DE-FC07-791D12026	2/28/83	---

* REOPENED 12/15/83: MOD 008: NCTE TO 9/30/83

DOE STATE COUPLED PROGRAM
 LOW-TEMPERATURE GEOTHERMAL RESOURCE ASSESSMENT
 CONTRACT STATUS OCTOBER 31, 1982

STATE	AGENCY	CONTRACT NUMBER	SCHEDULED COMPLETION	STATUS 10/31/82
(A) COMPLETED CONTRACTS				
ALASKA	GEOPYS. INSTITUTE	DE-AS07-78ID01720	12/31/79	COMPLETED 9/82
ALASKA	GEOPHYS. INSTITUTE	DE-FC07-79ET27034	4/15/82	COMPLETED 8/82
NORTH DAKOTA	UNIVERSITY OF,	DE-FC07-79ID12030	5/1/82	COMPLETED 8/82
OREGON	STATE OF,	DE-FC07-79ET27220	5/1/82	COMPLETED 7/82
(B) CONTRACTS SCHEDULED FOR COMPLETION IN 1982				
ARIZONA	STATE OF,	DE-FC07-79ID42009	6/30/82	FINAL REPORT REVIEW
COLORADO	GEOLOGICAL SURVEY	DE-AS07-77ET28365	12/31/82	REPORT PREP.
IDAHO	DEPT. WATER RESOURCES	DE-AS07-77ET28407	12/31/82	REPORT PREP.
KANSAS	GEOLOGICAL SURVEY	DE-AS07-79ET27204	9/20/82	FINAL REPORT REVIEW
NEW MEXICO	NM STATE UNIVERSITY	DE-AS07-78ID01717	12/31/82	REPORT PREP.
OKLAHOMA	UNIVERSITY OF,	DE-AS07-80ID12172	12/31/82	REPORT PREP.
TEXAS	CENTRAL METHODIST U	DE-AS07-79ID12037	8/31/82	REPORT PREP.
TEXAS	TENRAC	DE-FC07-79ID12080	11/30/82	REPORT PREP.
(C) CONTRACTS SCHEDULED FOR COMPLETION IN 1983				
ALASKA	STATE OF	DE-FC07-79ET27105	1/15/83	-
MASSACHUSETTS	AMHERST COLLEGE	DE-FC07-80RA50272	1/1/83	-
MONTANA	UNIVERSITY OF,	DE-FC07-79ID12033	9/30/83	-

C) CONTRACTS SCHEDULED FOR COMPLETION IN 1983 (CONT'D)

NEBRASKA	UNIVERSITY OF,	DE-ASOT-79 ET 27205	3/31/83	-
OREGON	STATE OF, (CASCADES)	DE-FCOT-79 ID 12044	9/30/83	-
TEXAS	BU. ECON. GEOLOGY	DE-ASOT-79 ID 12057	2/28/83	-
UTAH	GEOLOGICAL SURVEY	DE-ASOT-79 ET 28393	3/31/83	-
WASHINGTON	STATE OF,	DE-ACOT-79 ET 27014	7/31/83	-
WYOMING	UNIVERSITY OF,	DE-FCOT-79 ID 12026	2/28/83	-

DOE STATE-COUPLED PROGRAM
 LOW TEMPERATURE GEOTHERMAL RESOURCE ASSESSMENT
 CONTRACT \$ x 1000 [As of 10/1/82]

<u>PARTICIPATING STATE</u>	<u>FUNDING</u>		
	<u>DOE</u>	<u>STATE</u>	<u>TOTAL</u>
ALASKA	\$ 1,199	\$ 462	\$ 1,661
ARIZONA	1,069	--	1,069
CALIFORNIA	543	45	588
COLORADO	897	--	897
HAWAII	350	150	500
IDAHO	1,017	--	1,017
KANSAS	374	28	402
MASSACHUSETTS	65	--	65
MONTANA	760	108	868
NEBRASKA	496	43	539
NEVADA	755	--	755
NEW MEXICO	872	232	1,104
NORTH DAKOTA	288	59	347
OKLAHOMA	244	69	313
OREGON	1,818	113	1,931
TEXAS	1,203	50	1,253
UTAH	798	72	870
WASHINGTON	795	212	1,007
WYOMING	589	47	636
TOTALS	<u>\$14,132</u>	<u>\$ 1,690</u>	<u>\$15,822</u>

LIST OF PARTICIPANTS: STATE COUPLED PROGRAM.

Geothermal Resources Council, TRANSACTIONS, Vol. 3 September 1979

STATE COUPLED RESOURCE ASSESSMENT PROGRAM - AN UPDATE

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Gerald P. Brophy
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The purpose of the State Coupled Resource Assessment Program of the Department of Energy, Division of Geothermal Energy (DOE/DGE), is the identification and evaluation of low temperature (<90°C) geothermal resources. This program is presently active in 17 western states (Fig. 1). The program is divided into two phases: resource identification (Phase I) and reservoir confirmation (Phase II). Personnel from DOE/DGE, various state agencies acting as resource assessment teams, the Earth Science Laboratory/ University of Utah Research Institute (ESL/UURI), the U.S. Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and the Los Alamos Scientific Laboratory (LASL) are involved in the program (Tables 1 and 2).

Phase I, resource identification, centers upon the compilation of temperature, chemical and productivity data from known thermal springs and wells, and the identification of new low temperature geothermal exploration targets. Geothermal resource maps that depict this information will be published. The first map from each state will be a non-technical, user-oriented map, which should be completed by late 1979. A second map, oriented toward geoscientists and engineers, will be published later. Each state team is contributing data to GEOTHERM, the USGS computer file of thermal spring and well information. These data were also used by the USGS to define areas "...favorable for discovery and development of ...low temperature (<90°C) geothermal waters" as depicted in USGS Circular 790 (Muffler, 1979).

Phase II, reservoir confirmation, involves detailed geoscientific studies at favorable thermal sites located primarily near potential users, and resource confirmation drilling of the most attractive targets.

The information gathered during the State Coupled Resource Assessment Program will stimulate geothermal development by increasing public awareness of and interest in low-temperature geothermal resources, and by making resource data available to developers and users.

REFERENCE CITED

Muffler, L.J.P., ed., 1979, Assessment of geothermal resources of the United States - 1978: U.S. Geological Survey Circular 790, 163 p.

TABLE 1
PARTICIPANTS IN THE STATE COUPLED PROGRAM

DGE/DOE

- Funding
- Business Management

STATE AGENCY

- Overall Project Management
- Data Compilation, Interpretation, Reporting
- Site Specific Reservoir Confirmation

ESL/UURI

- Assist DGE in Technical Project Management
- Technical Help to States
- Coordination Among States, USGS, NOAA

USGS

- Base Data for Maps at 1:500,000
- Assist in Geoscience Data Interpretation
- Data Transfer to File GEOTHERM

NOAA

- Publish State Geothermal Resource Maps

LASL

- Technical Help to Arizona

TABLE 2
STATE COUPLED PROGRAM PERSONNEL

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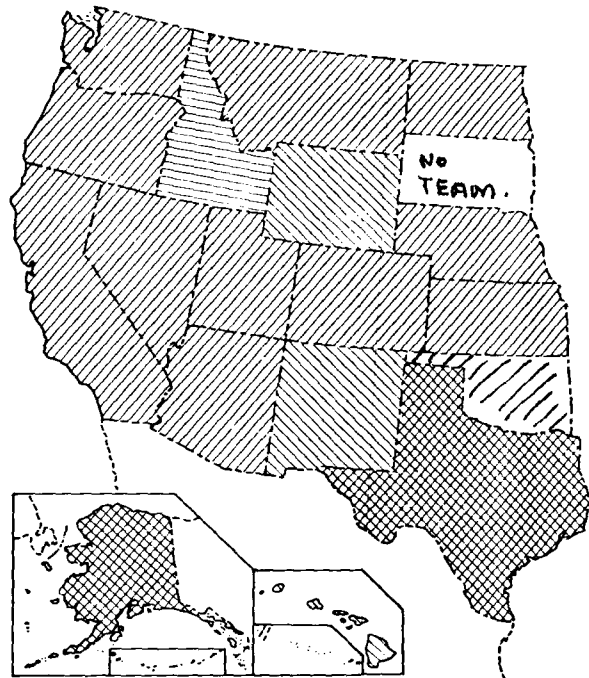


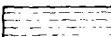


FIGURE 1

PRINCIPAL CONTRACTING AGENCIES

-  STATE SURVEYS
-  UNIVERSITIES
-  DEPARTMENT OF WATER RIGHTS

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SUBJECT: MANAGEMENT CHANGES AT DOE, WASHINGTON, DC, STATE COUPLED PROGRAM

Dear Mr. Ruscetta:

This letter is to notify State Coupled Resource Teams and associated groups that as a result of the reorganization of Department of Energy headquarters in Washington, DC, Mr. Leon Lehr has been named Program Manager for the Low Temperature Geothermal Resource Assessment Program which is under the DOE Division of Hydrothermal and Hydropower Technologies. His address is as follows:

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GHTD
Geothermal and
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Please notify your local contract officer of this change so that copies of monthly reports and other deliverables or correspondence will be properly directed to the responsible authority.

Very truly yours,

Susan Prestwich
Susan Prestwich
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