

ABSTRACT

PARTNERSHIP FOR ENVIRONMENTAL TECHNOLOGY EDUCATION (PETE)

The need for broad cooperative effort directed toward the enhancement of science, mathematics and technical education, including environmental science and technology, has been recognized as a national priority by government, industry, and the academic community alike. In an effort to address this need, the Partnership for Environmental Technology Education (PETE) has been established as a national non-profit organization designed to link the technical resources of the DOE, DoD, EPA, and NASA Laboratories, federal and state agencies, private industry and professional societies with participating community colleges. PETE's programmatic focus is to assist in the development and presentation of curricula for training environmental technicians, to encourage more transfer students to pursue studies in environmental science, engineering and management at four-year institutions and to conduct special projects designed to enhance the participation of underrepresented minorities and women in environmental fields, promote technology transfer, etc. The PETE network, piloted originally in the five western states of Arizona, California, Hawaii, Nevada and Utah, now consists of six regional public/private partnerships serving all fifty states, Puerto Rico and the U. S. territories.

INTRODUCTION

The need for broad cooperative effort directed toward the enhancement of science, mathematics and technology education in the United States has been recognized as a national priority by government, industry and the academic community alike. Within the context of this broad need, the U. S. Department of Energy (DOE), the U. S. Environmental Protection Agency (EPA), and the Department of Defense (DoD) have defined "needs driven" or specific interests which require increasing the numbers of qualified graduates in areas of environmental science, engineering and management, including technicians, and fostering improved public literacy in environmental science and waste management. Carefully targeted education intervention programs are required if these important goals are to be realized.

There are approximately 1,200 community, technical and junior colleges in the U. S. with a 1992 student population of 6.0M. This does not include another 6.0M non-credit enrolled students attending these two-year institutions. On the basis of sheer numbers alone, these institutions represent a significant, nationwide resource that should play a key role in the conduct of a successful environmental protection/restoration and waste management education and training program.

Community colleges have been in the process of a major transition during the 1980s. They have moved toward a much stronger role in vocational education and in supporting U. S. industry. Despite this major shift toward vocational education, however, the nation's community colleges still represent a key transition point for millions of students (particularly minority students) between high school and the four-year institutions. Operating on a philosophy of higher education opportunity for all, with minimal entrance requirements and low cost, the community colleges afford the average high school student the opportunity to start college when they may not have qualified to enter a four-year institution, or may still be trying to decide the appropriate direction of their college careers. The community colleges also increasingly represent the easy access, low cost alternative for people already in the work force to return for continuing vocational training or retraining for new career directions.

For these reasons, most of the minority or other disadvantaged students presently pursuing post-secondary education in the U. S. today are attending a community college. An environmental education intervention program which recognizes current problems in the nation's education system and is geared to the realities of changing demographics must focus adequate programmatic attention on this pivotal segment of the education pipeline.

PETE'S MISSION

Provide leadership in environmental education and training through community and technical college partnerships with industry and government.

APPROACH

PETE has been established as a national non-profit organization consisting of six regional public/private partnerships. These regional partnerships are designed to link the technical resources of federal laboratories, state and federal agencies and the private sector with a network of community colleges to provide direct technical assistance for:

- Development and presentation of broad environmental technician curricula at the two-year degree/certificate level,

- Development of clearly articulated education pipelines in environmental studies targeting the attraction of high school students and preparation of transfer students to four-year institutions,
- Conduct of special projects in support of national environmental education, training, job creation, and public scientific literacy goals.

PETE is designed to provide a permanent organizational framework, organized nationally, but implemented regionally, within which employers, federal laboratories, government and professional organizations can contribute to the development of strong, responsive community college environmental education and training networks. Once in place, the partners will draw upon this network for new employees, training services, and the support of special activities.

GOALS

- 1) Create permanent regional public-private partnerships to support a national network of community colleges delivering quality environmental education and training.
- 2) Develop and support quality community and technical college programs targeting environmental technicians.
- 3) Establish quality articulated programs creating an environmental education ladder from high school through the post graduate level.
- 4) Meet the environmental technician workforce education, training and retraining needs of the nation.
- 5) Stimulate economic development and international competitiveness through facilitating environmental technology transfer among U. S. business, industry and government.
- 6) Contribute to the improvement of global environmental quality through international programs and partnerships in environmental education and training.

NCRVE NATIONAL LABOR MARKET STUDY

The National Center for Research in Vocational Education, a part of the U. C. Berkeley Graduate School of Education, is a study center funded by the U. S. Department of Education. The Center has completed a two-year assessment of the projected national labor market demand and skills requirements for Environmental-Hazardous Materials Technicians and Related Workers on a matching funds basis as a part of its Department of Education-supported program. This study concluded, among other things, that there was a significant growing demand for properly prepared Associate of Science degree level technicians and "highly recommended that the community college system rigorously pursue advancement of such courses." The study was co-sponsored by DOE (through PETE) and the US Department of Education.

PILOT PROGRAM

PETE was initiated in FY 1991 by the U. S. Department of Energy (DOE) on a pilot basis in the five western states of Arizona, California, Hawaii, Nevada and Utah. The purpose was to demonstrate the concept of establishing a public/private partnership on a regional scale that implemented the approach described above. The primary focus of effort during this pilot period was the establishment of the participating community college network, the supporting partners and the organizational framework necessary to ensure effective coordination and maximum cooperation. In cooperation with the State of California, PETE has assisted in establishing a

network of 40 community colleges in the five states constituting Western PETE. These colleges are now offering or are in the process of developing Associate of Science degree/certificate programs in environmental technology. A program for faculty development has been implemented including regional conferences (seven to date) and summer internships in the Laboratories, the offices of state regulatory agencies, DoD facilities, and private industry locations. A Student Work Experience Program is being planned to begin in the summer of 1995. Western PETE has also initiated a program focused on the development of formal articulation agreements between the community colleges, the high schools that feed those colleges, and the universities (e.g. 2+2+2/Tech Prep).

The Western PETE program has been developed through the collaboration of the following key regional players:

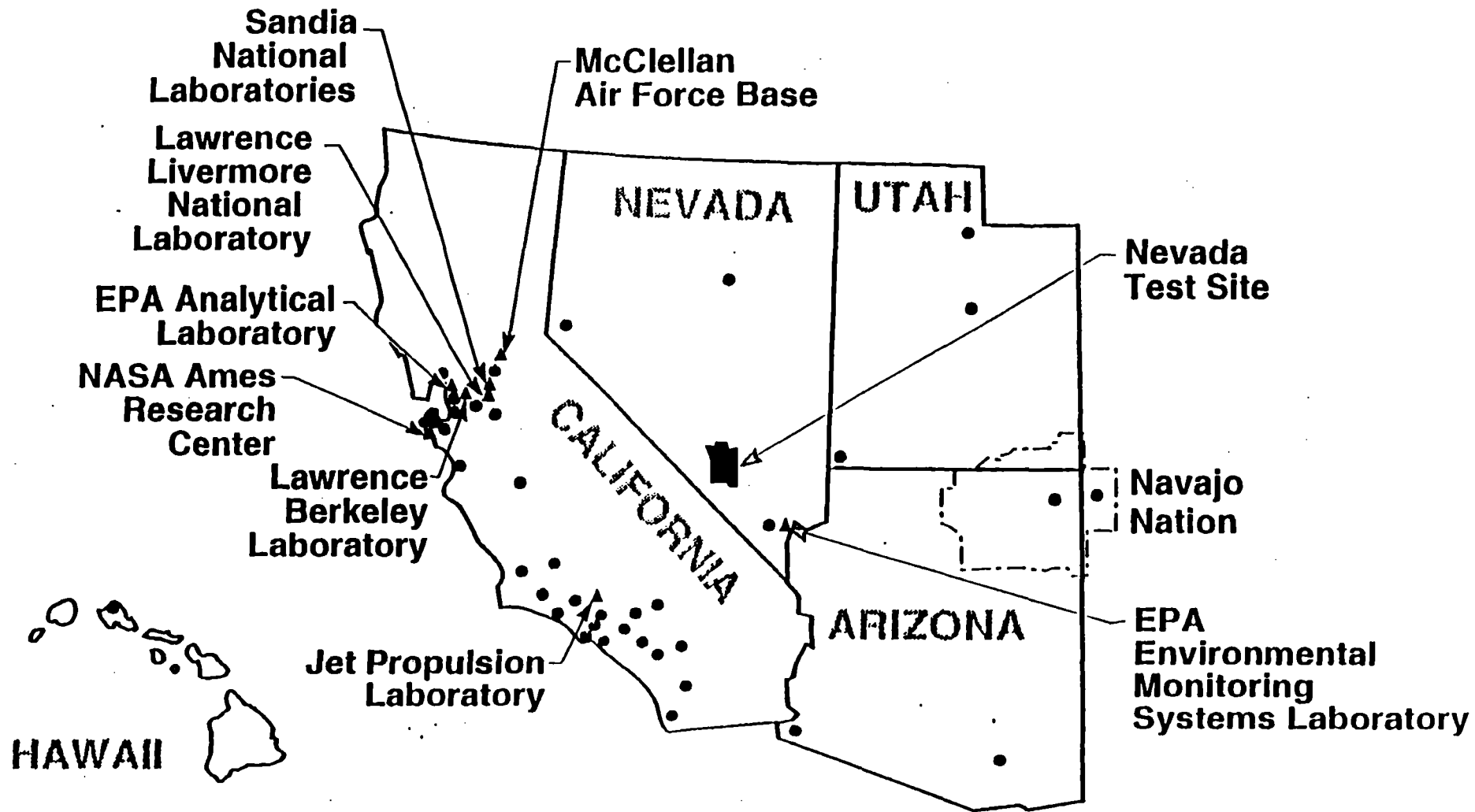
- Ames Research Center (NASA)
- Arizona, California, Hawaii, Nevada, Utah Community Colleges
- Arizona Department of Environmental Quality
- Arizona Industry Education Advisory Committee
- California Environmental Protection Agency
- Environmental Monitoring Systems Laboratory (EPA)
- Industry Education Council of California
- Jet Propulsion Laboratory (NASA)
- Lawrence Berkeley Laboratory (DOE)
- Lawrence Livermore National Laboratory (DOE)
- McClellan Air Force Base (DoD)
- National Center for Research in Vocational Education
- National Environmental Training Association
- The Navajo Nation and Navajo Community College
- Nevada Test Site (DOE)
- Region IX Analytical Laboratory (EPA)
- Sandia National Laboratories, California (DOE)
- Utah Industry Education Advisory Committee
- Western Division Naval Facilities Engineering Command (DoD)

Also participating in the program is the American Association of Community Colleges, the Department of Energy Oakland and Nevada Operations Offices, and the EPA Region IX Office. The California EPA participation includes the Air Resources Board and the Department of Toxic Substances Control. Representatives of the Environmental Protection Office in each of the other four PETE states have also been invited to participate. Representatives of these organizations operated as a Steering Committee until late 1993 when the group was constituted as a Board of Directors following non-profit incorporation in the State of Arizona.

NATIONAL PETE

Based on the successful Western PETE model, a total of six regional partnerships have now been established serving all fifty states, Puerto Rico and the U. S. territories. PETE's national objectives are to establish the six regional partnerships with consistent organizational structure and a common commitment to the six goals listed above. National initiatives focused on such areas as enhancing the participation of underrepresented minorities and women, enhancing the science and environmental education capabilities of Tribal Colleges, worker retraining associated with defense conversion, and innovative approaches to environmental technology transfer will be delivered in a consistent fashion through the six regions. Each regional organization is intended to organize and function, however, as a semi-independent partnership also focused on uniquely regional problems and developing local resources. It is estimated that the national PETE community college network will represent up to 500 colleges delivering a variety of environmental programs.

PETE Colleges - FY 1994



40 Participating Community Colleges

ROLE OF PRIVATE INDUSTRY AND PROFESSIONAL SOCIETIES

Private industry and professional societies will play a vital role in the development and conduct of the program. This includes advising on skills requirements and on curricula development and presentation. Along with government, private industry will be a primary beneficiary of the significantly increased number of technician graduates which will result from this initiative. We will seek substantial private sector participation and/or in-kind support for the program. This could primarily involve assistance with equipment needs, co-sponsorship of semi-annual regional conferences, and summer internship opportunities for instructors and students. The Industry Education Council of California, a statewide consortium of government, industry and academia, is a full partner in Western PETE, bringing direct access to many of the state's major corporations. This model will also be followed throughout the six PETE regions.

PETE and the Air and Waste Management Association have signed a formal Memorandum of Understanding to collaborate on environmental education programs of mutual interest. The American Chemical Society is also advising on the development of the regional and national PETE initiative.

CURRICULA AND TEACHING AIDS DEVELOPMENT

One of the primary issues raised since the formation of PETE has been the general lack of appropriate texts and teaching aids to support environmental-hazardous materials technician curricula at the community college level. In response to this need, a National Instructional Materials Working Group was established, which included representatives from eight leading colleges outside the Western PETE region, to develop teaching materials for core curriculum modules in this field. Eight core module outlines have been developed. PETE has entered into a Cooperative Agreement with INTELECOM, a non-profit community college telecommunications consortium, to manage the project and develop accompanying video sets. The firm of Van Nostrand Reinhold (New York) has been selected as lead publisher. This project entitled "*Preserving the Legacy*" is expected to require up to five years for completion.

NATIONAL SCIENCE FOUNDATION SUPPORT

In July 1994 NSF accepted two proposals which will assist in supporting PETE's long-term objectives. PETE will partner with the Hazardous Materials Training and Research Institute (HMTRI) and the University of Northern Iowa's Center for Environmental and Energy Education to establish a national Advanced Technology Environmental Education Center (ATEEC). The vision is to create a world class network of community college environmental programs linked with high schools that inform and prepare students for entry into these two-year programs. The ATEEC has established three broad goals: 1) Develop nationally validated curriculum models and advanced instructional materials; 2) Establish comprehensive programs of professional development; and 3) Build a clearinghouse to serve as a national center for environmental education. NSF will fund ATEEC at a level of \$1.0M per year for three years.

NSF will also fund the initiation of the "*Preserving the Legacy*" instructional materials development project at a level of \$0.5M per year for three years. Other federal and private sponsors will be sought to support the balance of the project.

INTERNATIONAL PROGRAMS

PETE has been receiving growing international attention and has begun some collaboration in other countries. The Partnership is assisting in the establishment of an environmental training network in Mexico, the International Institute for Environmental Technology and Management (IETM), designed to assist that country in complying with the environmental side agreements of



★ = DOE Production Complex

the North American Free Trade Agreement (NAFTA). This developing partnership with Mexico will focus on linking U. S. community colleges with Mexican institutions to deliver Train-The-Trainer programs for worker preparation in areas such as hazardous waste management, water-waste water management, site remediation, etc. PETE will also assist in linking U. S. and Mexican university programs in environmental areas.

ORGANIZATION AND MANAGEMENT

The national PETE program has been incorporated as a non-profit educational organization, and a national office with a small program development staff established in Northern California. A Board of Directors has been named consisting of representatives of each of the six regional partnerships and selected organizations, and an Executive Director appointed. A Presidents Council, consisting of designated community college Presidents from each of the six regions will serve in a key advisory capacity to the Board of Directors. A national Advisory Council will also be established which will include representatives of participating federal agencies, private industry and professional societies. Each of the six regional partnerships is functioning under a Steering Committee or Board of Directors with a designated non-profit organization serving as fiscal agent. Program implementation will be the responsibility of six regional Executive Directors and the national PETE Executive Director.

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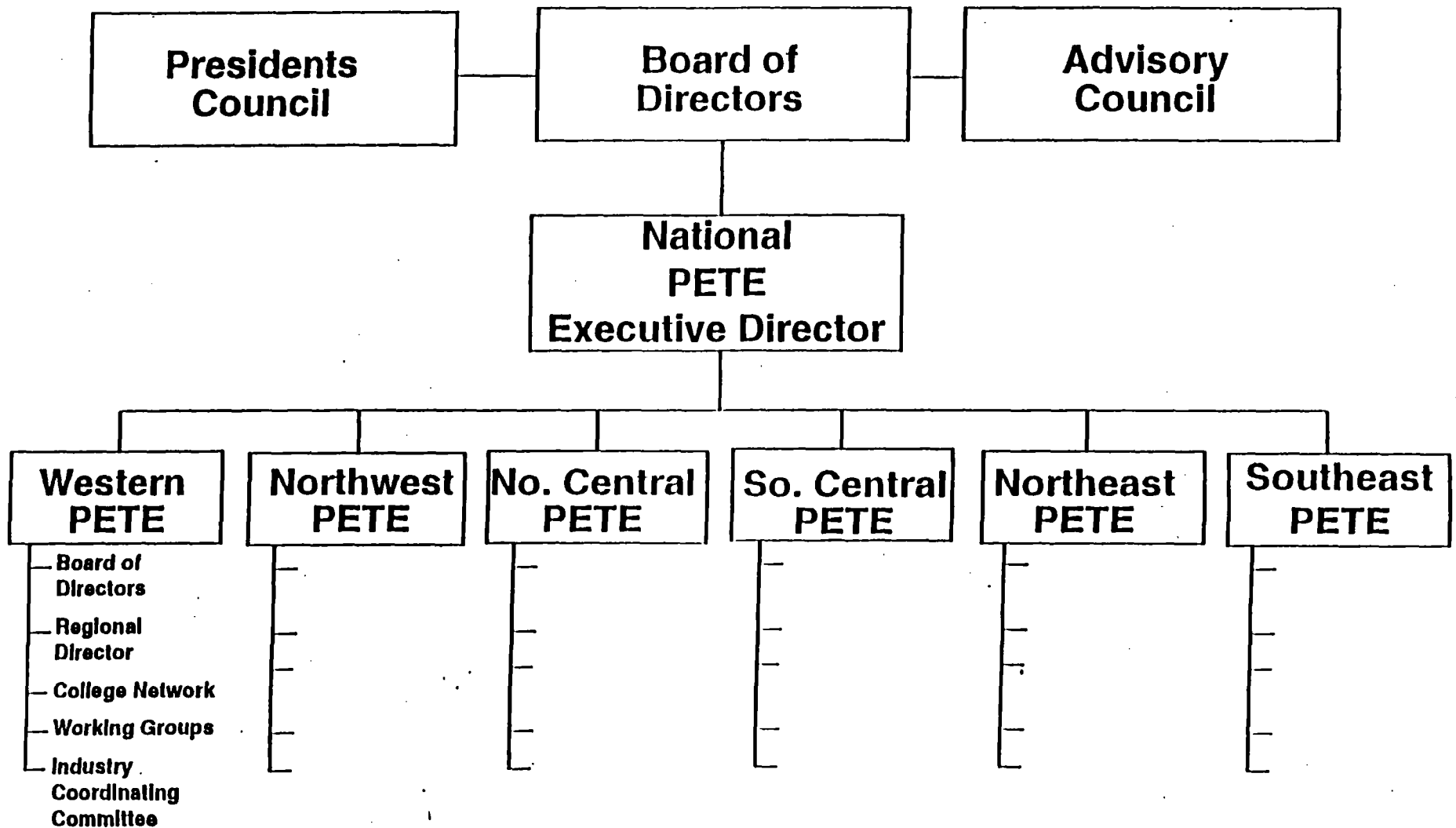
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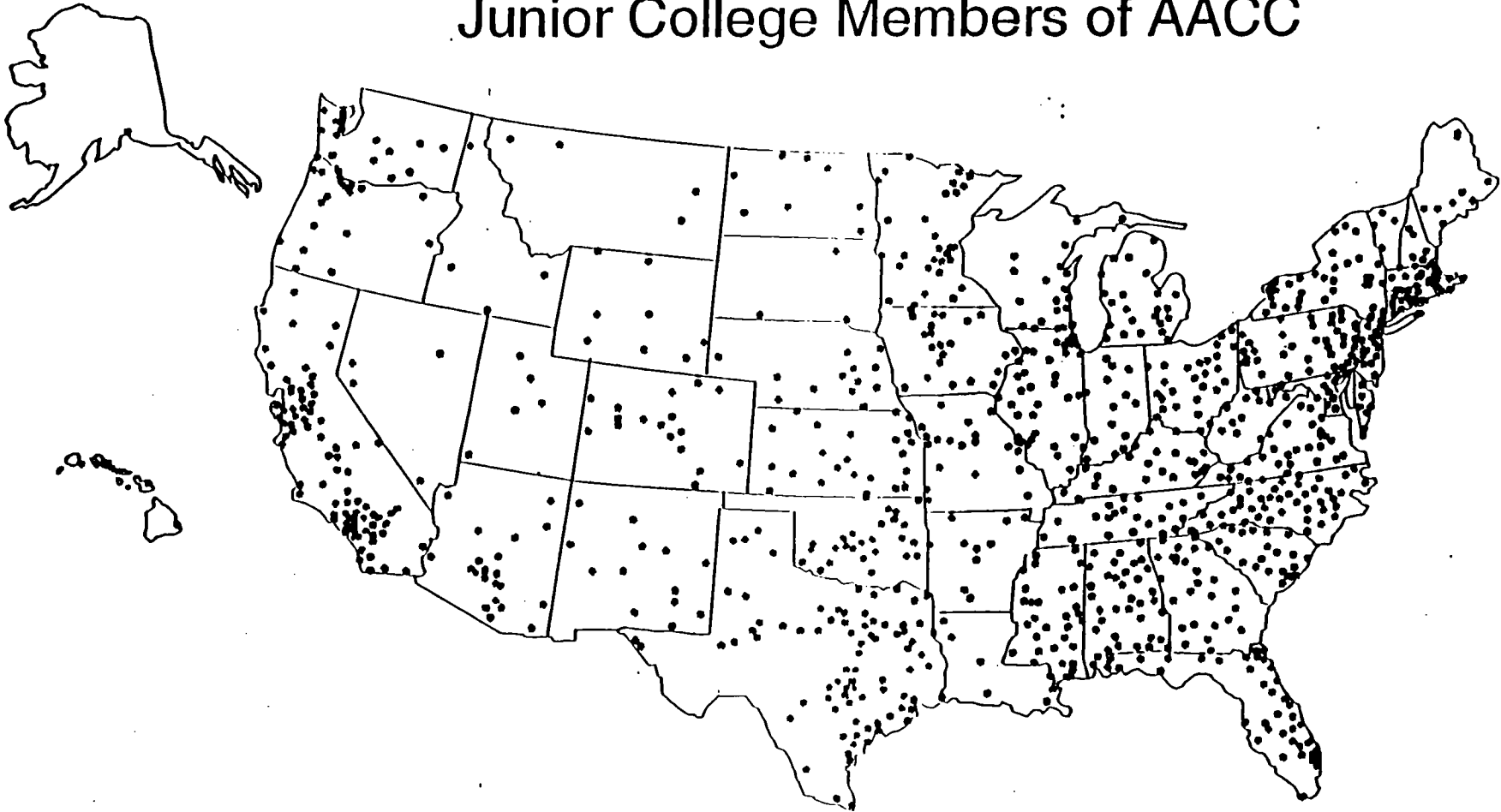
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NATIONAL PETE ORGANIZATION



Community, Technical, and Junior College Members of AACC



Total Colleges = 1222

EPA Laboratories

DOE Multi-Program Laboratories / NTS

