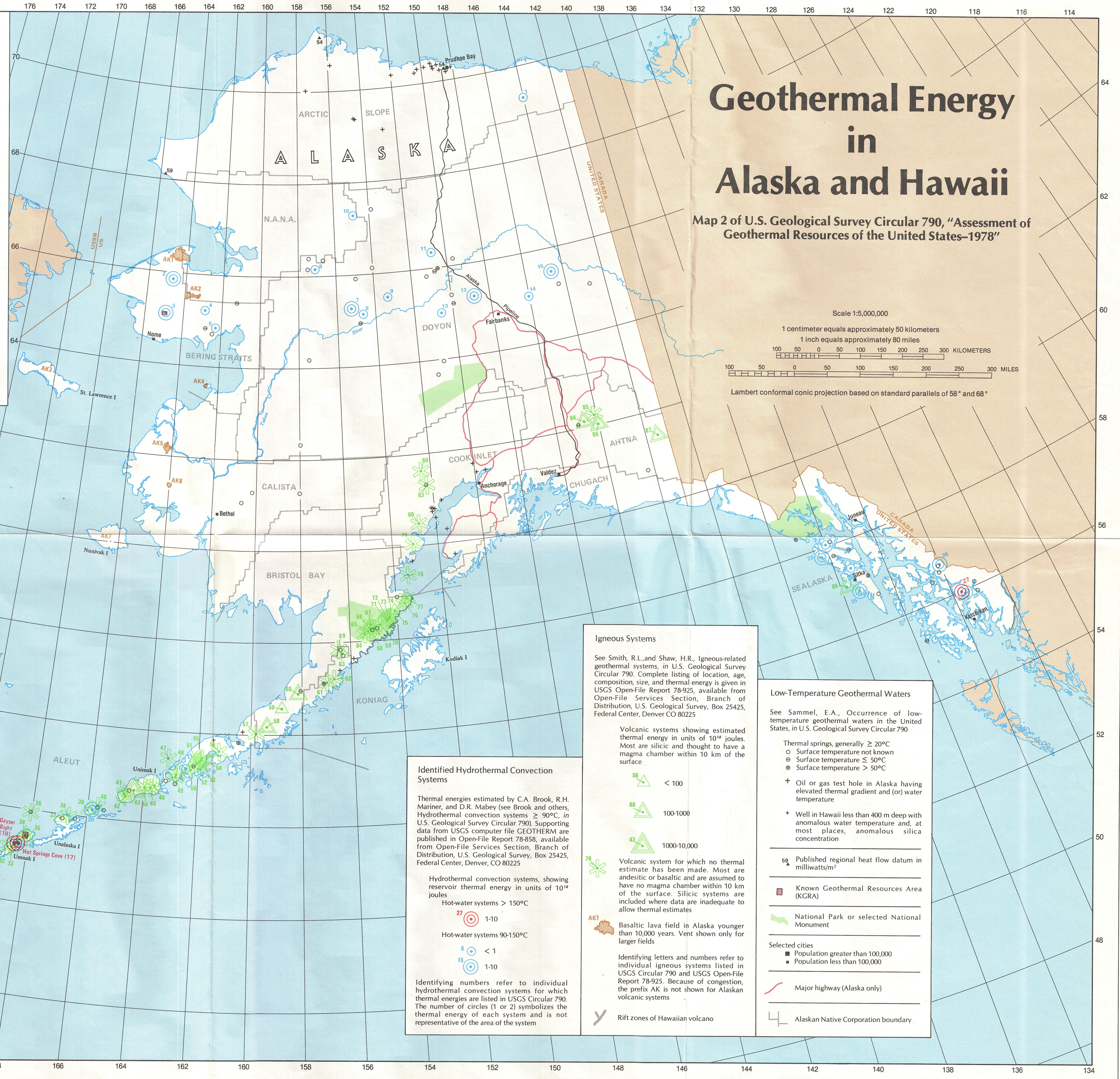


# Geothermal Energy in Alaska and Hawaii

Map 2 of U.S. Geological Survey Circular 790, "Assessment of Geothermal Resources of the United States-1978"



This map was prepared for the  
**United States Geological Survey**  
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**NOAA** **USGS**

The structural setting of the Aleutian chain and the presence of many young volcanic complexes suggest a large geothermal potential. However, because of remoteness, sparse population, and unbroken weather, the area has not yet attracted extensive exploration effort.

Map produced by Paul J. Grim (National Geophysical and Solar-Terrestrial Data Center) and George W. Berry (Earth Science Laboratory/University of Utah Research Institute) with assistance of Joy A. Ikelman, Thomas S. Jackson, and Ronald H. Smith  
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For full references, credits, and explanations of data sets, see Muffler, L.J.P., ed., 1979, Assessment of geothermal resources of the United States—1978, U.S. Geological Survey Circular 790

Unfolded map available from NOAA/National Ocean Survey, Distribution Division, C44, Riverdale, MD 20840

USGS Circular 790 with folded maps available free of charge from Branch of Distribution, U.S. Geological Survey, 1200 South Eads St., Arlington, VA 22202.

**Identified Hydrothermal Convection Systems**

Thermal energies estimated by C.A. Brook, R.H. Mariner, and D.R. Mabey (see Brook and others, Hydrothermal convection systems  $\geq 90^\circ\text{C}$ , in U.S. Geological Survey Circular 790). Supporting data from USGS computer file GEOTHERM are published in Open-File Report 78-858, available from Open-File Services Section, Branch of Distribution, U.S. Geological Survey, Box 25425, Federal Center, Denver, CO 80225.

Hydrothermal convection systems, showing reservoir thermal energy in units of  $10^{14}$  joules

Hot-water systems  $> 150^\circ\text{C}$

Hot-water systems  $90-150^\circ\text{C}$

Identifying numbers refer to individual hydrothermal convection systems for which thermal energies are listed in USGS Circular 790. The number of circles (1 or 2) symbolizes the thermal energy of each system and is not representative of the area of the system

**Igneous Systems**

See Smith, R.L., and Shaw, H.R., Igneous-related geothermal systems, in U.S. Geological Survey Circular 790. Complete listing of location, age, composition, size, and thermal energy is given in USGS Open-File Report 78-925, available from Open-File Services Section, Branch of Distribution, U.S. Geological Survey, Box 25425, Federal Center, Denver, CO 80225.

Volcanic systems showing estimated thermal energy in units of  $10^{14}$  joules. Most are silicic and thought to have a magma chamber within 10 km of the surface

Volcanic system for which no thermal estimate has been made. Most are andesitic or basaltic and are assumed to have no magma chamber within 10 km of the surface. Silicic systems are included where data are inadequate to allow thermal estimates

Basaltic lava field in Alaska younger than 10,000 years. Vent shown only for larger fields

Identifying letters and numbers refer to individual igneous systems listed in USGS Circular 790 and USGS Open-File Report 78-925. Because of congestion, the prefix AK is not shown for Alaskan volcanic systems

Rift zones of Hawaiian volcano

**Low-Temperature Geothermal Waters**

See Sammel, E.A., Occurrence of low-temperature geothermal waters in the United States, in U.S. Geological Survey Circular 790

Thermal springs, generally  $\geq 20^\circ\text{C}$

Surface temperature not known

Surface temperature  $\leq 50^\circ\text{C}$

Surface temperature  $> 50^\circ\text{C}$

Oil or gas test hole in Alaska having elevated thermal gradient and (or) water temperature

Well in Hawaii less than 400 m deep with anomalous water temperature and, at most places, anomalous silica concentration

Published regional heat flow datum in milliwatts/m<sup>2</sup>

Known Geothermal Resources Area (KGRA)

National Park or selected National Monument

Selected cities

Population greater than 100,000

Population less than 100,000

Major highway (Alaska only)

Alaskan Native Corporation boundary