

U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

**Analytical results, sample locations, and other information
for stream-sediment, soil, heavy-mineral-concentrate,
and rock samples used in mineral resource studies of
Coronado National Forest and adjacent areas,
southeastern Arizona and southwestern New Mexico**

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Open-File Report 95-615

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This database, identified as CORONF.001, has been approved for release and publication by the Director of the U.S. Geological Survey (USGS). Although this database has been subjected to rigorous review and is substantially complete, the USGS reserves the right to revise the data pursuant to further analysis and review. Furthermore, it is released on condition that neither the USGS nor the United States Government may be held liable for any damages resulting from its authorized or unauthorized use.

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Samples of stream-sediment, soil, heavy-mineral concentrate derived from stream sediment, and rock were collected by USGS personnel during the course of geologic field studies in and adjacent to Coronado National Forest, southeastern Arizona and southwestern New Mexico. The samples were analyzed for a wide variety of elements. The database containing these analyses also includes data for stream-sediment and soil samples collected by the Department of Energy during the National Uranium Resource Evaluation (NURE) program. The complete database is a compilation of analytical data and collection information for 8,626 samples obtained over a period of more than 30 years. The methods, data, and documentation have been reviewed by peers within the USGS. The accompanying ASCII text file, EXPLAIN.DOC, presents background information, sampling techniques, and references; it also describes the digital data files and explains how to access them. The file, EXPLAIN.WPF, is the WordPerfect 5.1 form of EXPLAIN.DOC and contains sample-location maps.

SUMMARY

Analytical data and other information for 8,626 samples of stream sediment, soil, rock, and nonmagnetic heavy-mineral concentrate derived from stream sediment are presented in digital dBASE III format as compressed, self-extracting files. The data are a compilation of archived and recently produced data. The data were the basis for geochemical interpretations that were part of a mineral resource evaluation of Coronado National Forest (fig. 1), southeastern Arizona and southwestern New Mexico (du Bray, 1995).

The samples were collected from about 1963 to 1994. Data for approximately 2,500 of the samples have not been published previously and the published data are in about 20 different reports. This report brings the archived data together and contains new data for 2,547 stream-sediment and soil samples produced by modern, sensitive analytical techniques.

The routine method for analyzing stream-sediment, heavy-mineral-concentrate, and rock samples over the 30-year period was 30-element semiquantitative direct-current arc emission spectrography (ES). Ninety-one archived NURE samples were also recently analyzed by ES. The 30 elements routinely determined by ES were Ag, As, Au, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, La, Mg, Mn, Mo, Nb, Ni, Pb, Sb, Sc, Sn, Sr, Ti, V, W, Y, Zn, and Zr. Some ES analyses include Ga, Ge, Na, P, and Th. Archives for many of the samples include data obtained by methods other than ES; these methods were utilized in order to obtain results for additional elements or better sensitivity for some elements. The additional results are for As, Au, Bi, Cd, Cu, Hg, Pb, Sb, Te, Th, U, and Zn.

Archived data for NURE stream-sediment and soil samples include analyses for Ag, Al, B, Ba, Be, Ca, Ce, Co, Cr, Cu, Fe, Hf, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Sc, Sr, Th, Ti, U, V, Y, Zn, and Zr. The archived data for NURE samples are from analyses by inductively coupled plasma spectroscopy (ICP) except that U data are from neutron activation analyses.

In order to provide sample coverage for a few areas of sparse previous sampling, 159 samples of stream sediment were collected in 1990 and 1994. As part of the mineral resource evaluation of Coronado National Forest, the 159 new samples and 2,388 archived stream-sediment and soil samples were analyzed by graphite furnace atomic absorption spectrophotometry (GFAA) for gold to concentrations as low as 2 parts per billion. They were also analyzed by ICP for Ag, As, Au, Bi, Cd, Cu, Mo, Pb, Sb, and Zn. The 2,547 samples analyzed by GFAA and ICP give good coverage of mountain and range-front areas of Coronado National Forest. The recent analyses provide sensitive geochemical data for a number of elements (Ag, As, Au, Bi, Cd, Mo, Sb, Zn) that are useful for mineral resource evaluations and environmental studies but cannot be determined at sufficiently low concentrations by ES.

The following figures show sample localities for stream-sediment and soil samples analyzed by ES (fig. 2), stream-sediment and soil samples analyzed by GFAA and ICP (fig. 3),

heavy-mineral-concentrate samples (fig. 4), rock samples (fig. 5), and NURE stream-sediment and soil samples (fig. 6).

REFERENCE

du Bray, E.A., ed., 1995, Mineral resource potential and geology of Coronado National Forest, southeastern Arizona and southwestern New Mexico: U.S. Geological Survey Bulletin 2083, 209 p., 32 plates.

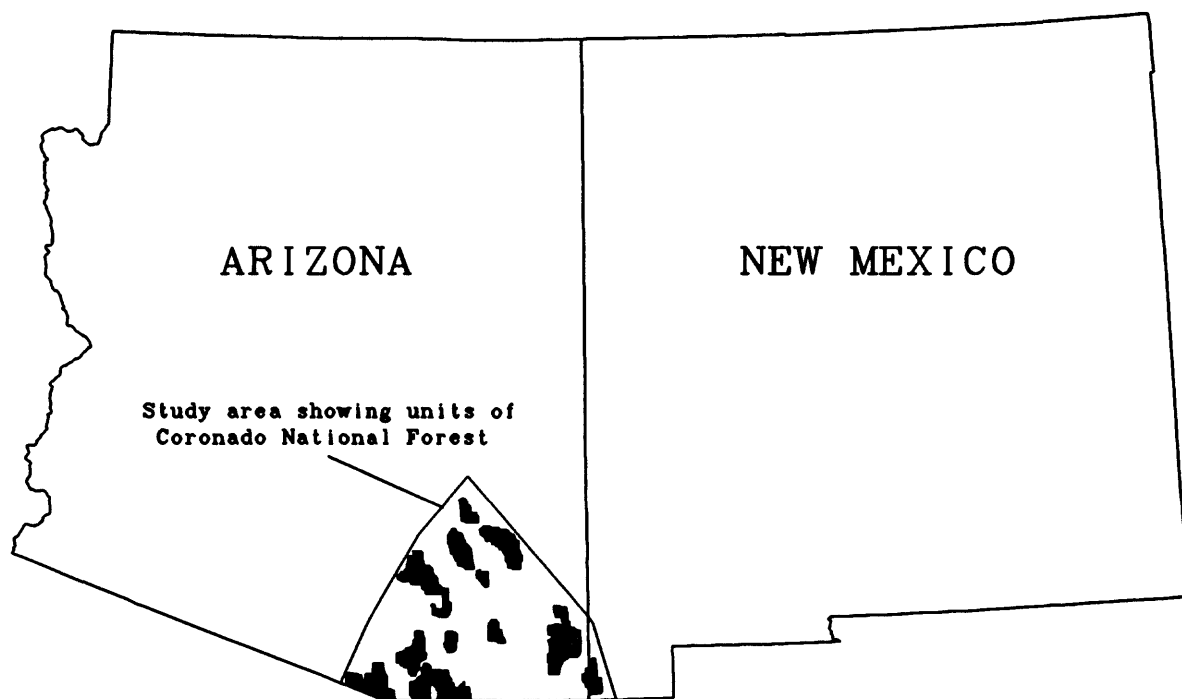


Figure 1.--Location of Coronado National Forest and Coronado Study Area

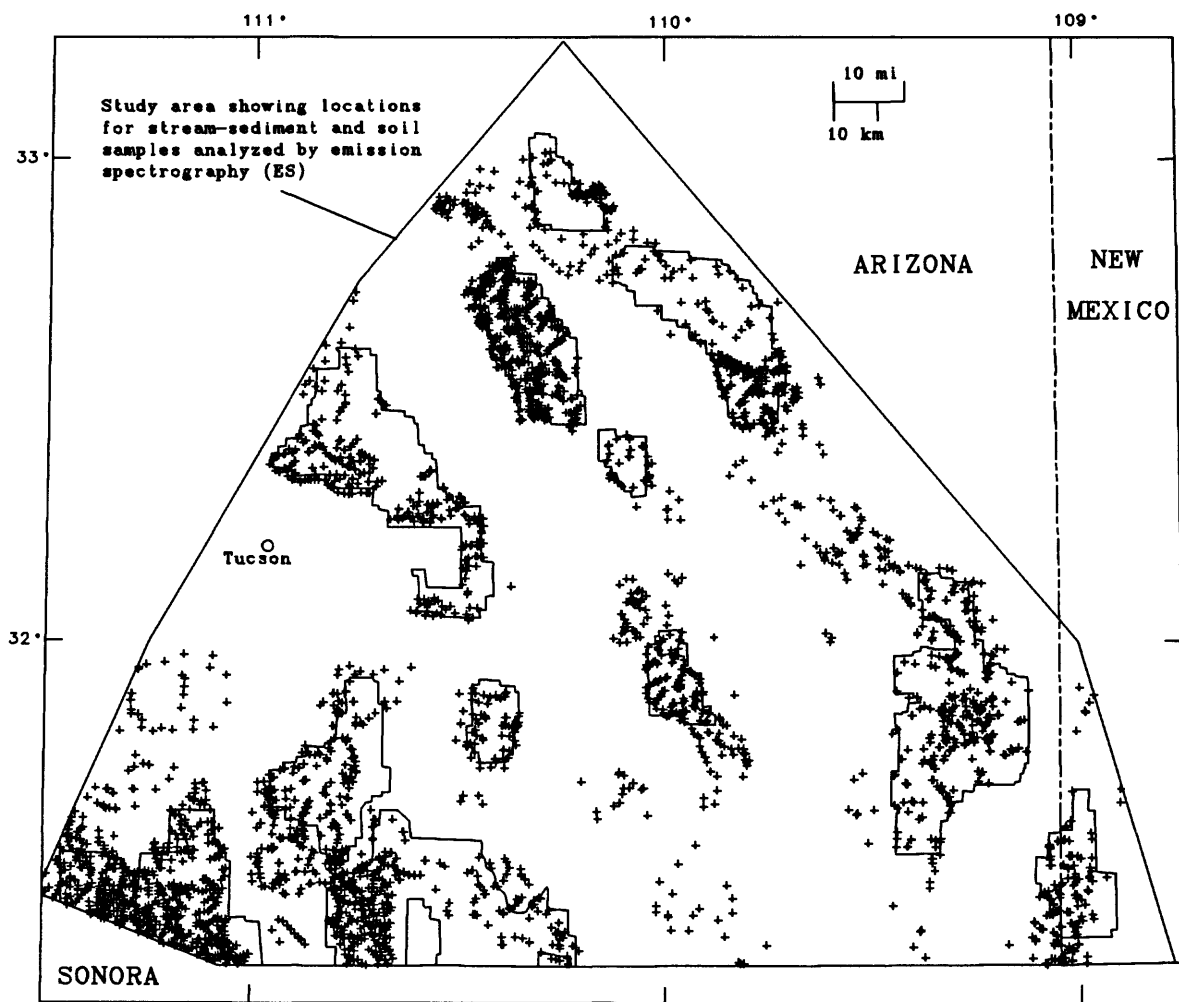


Figure 2.--Sampling locations for stream-sediment and soil samples analyzed by emission spectrography

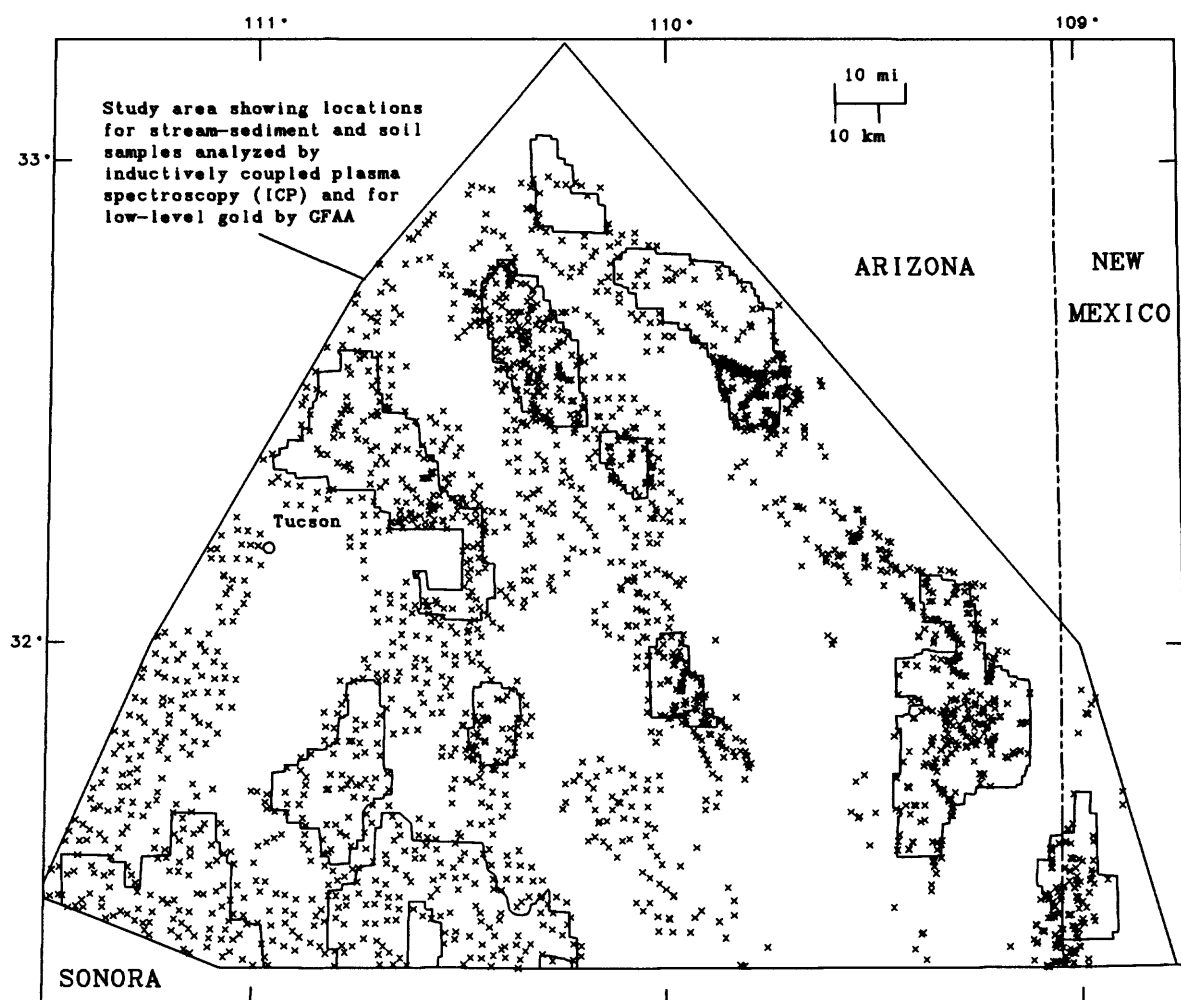


Figure 3.--Sampling locations for stream-sediment and soil samples analyzed by inductively coupled plasma spectroscopy and for low-level gold by graphite furnace atomic absorption spectrophotometry

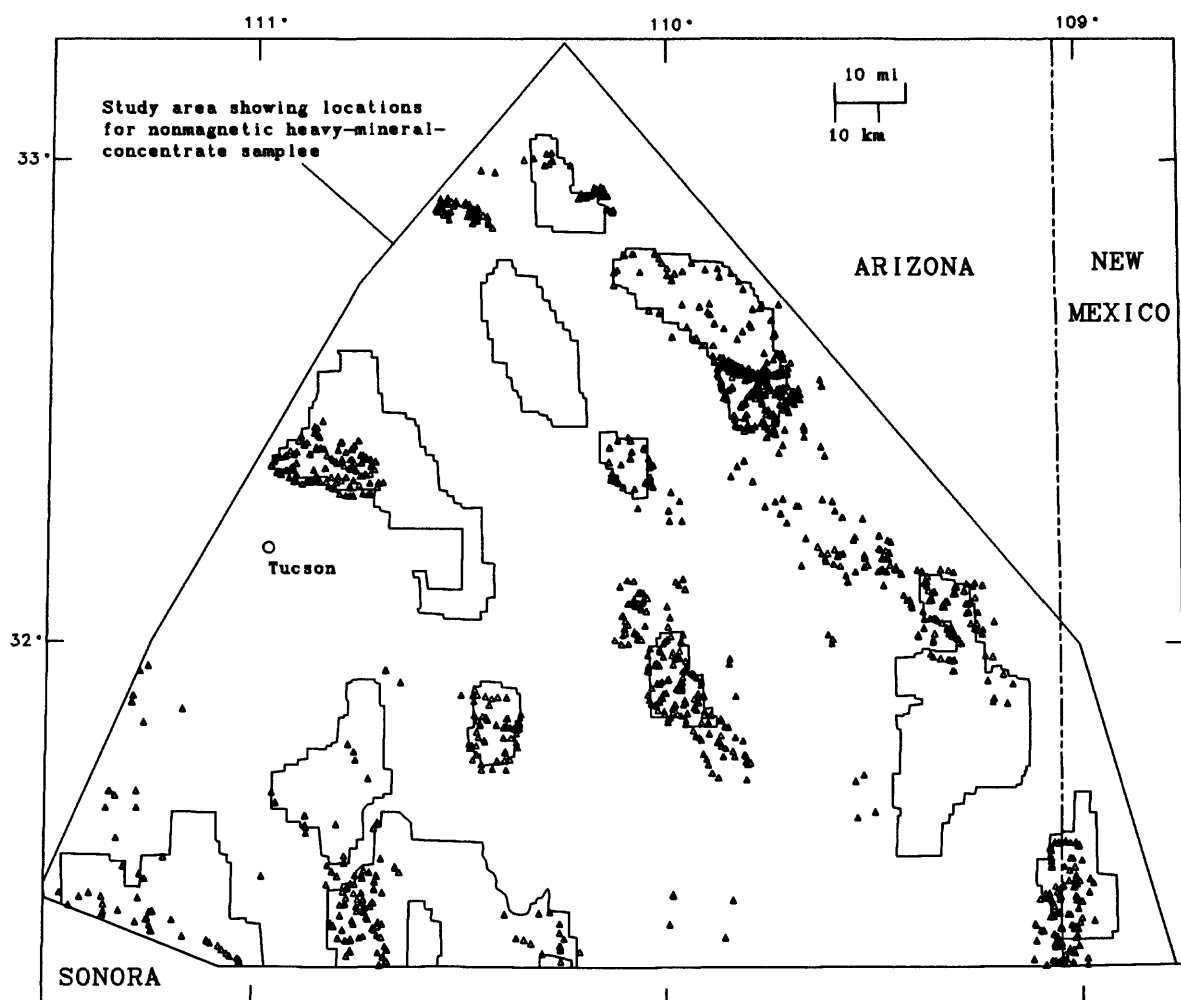


Figure 4.--Sampling locations for nonmagnetic heavy-mineral-concentrate samples

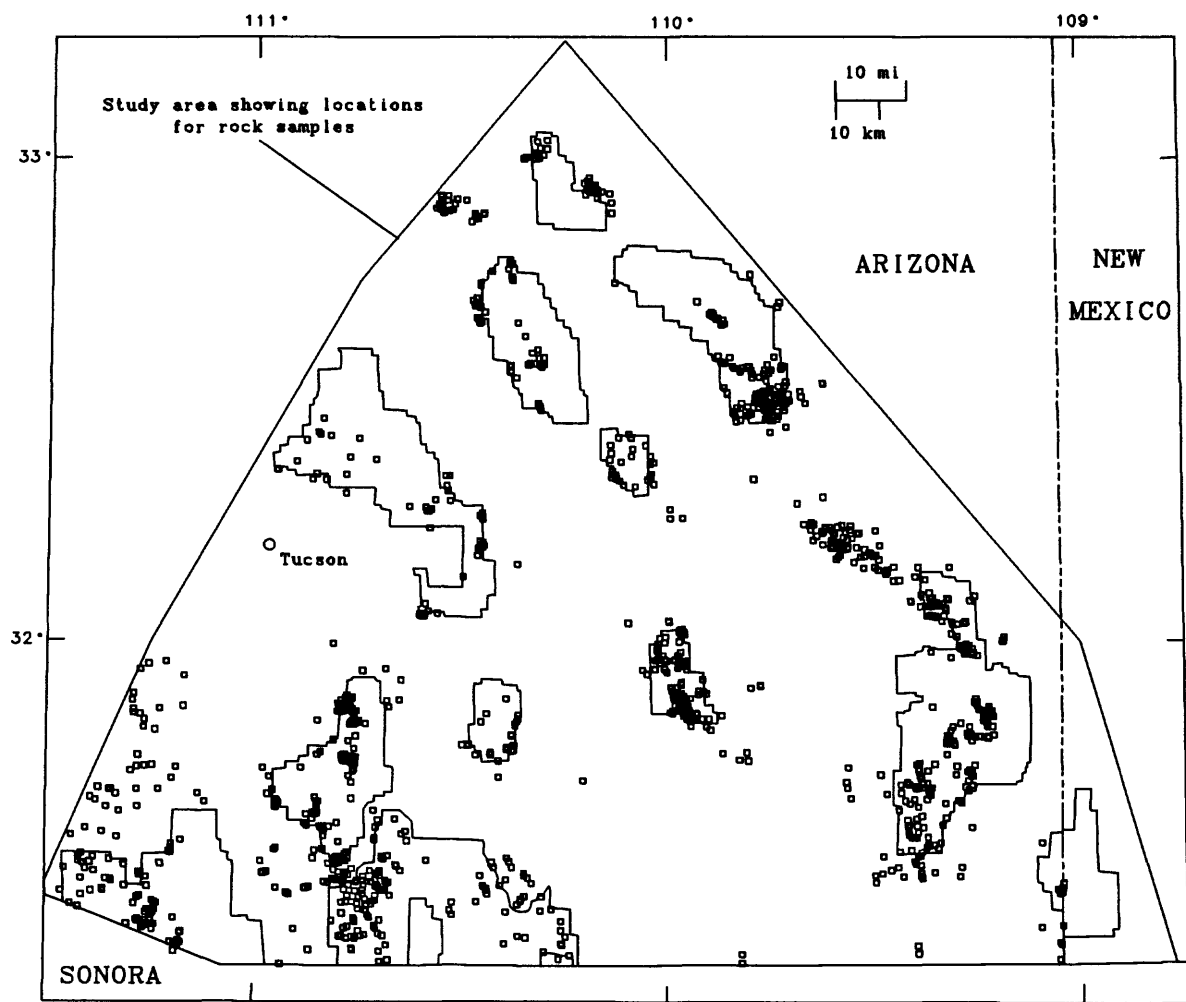


Figure 5.--Sampling locations for rock samples

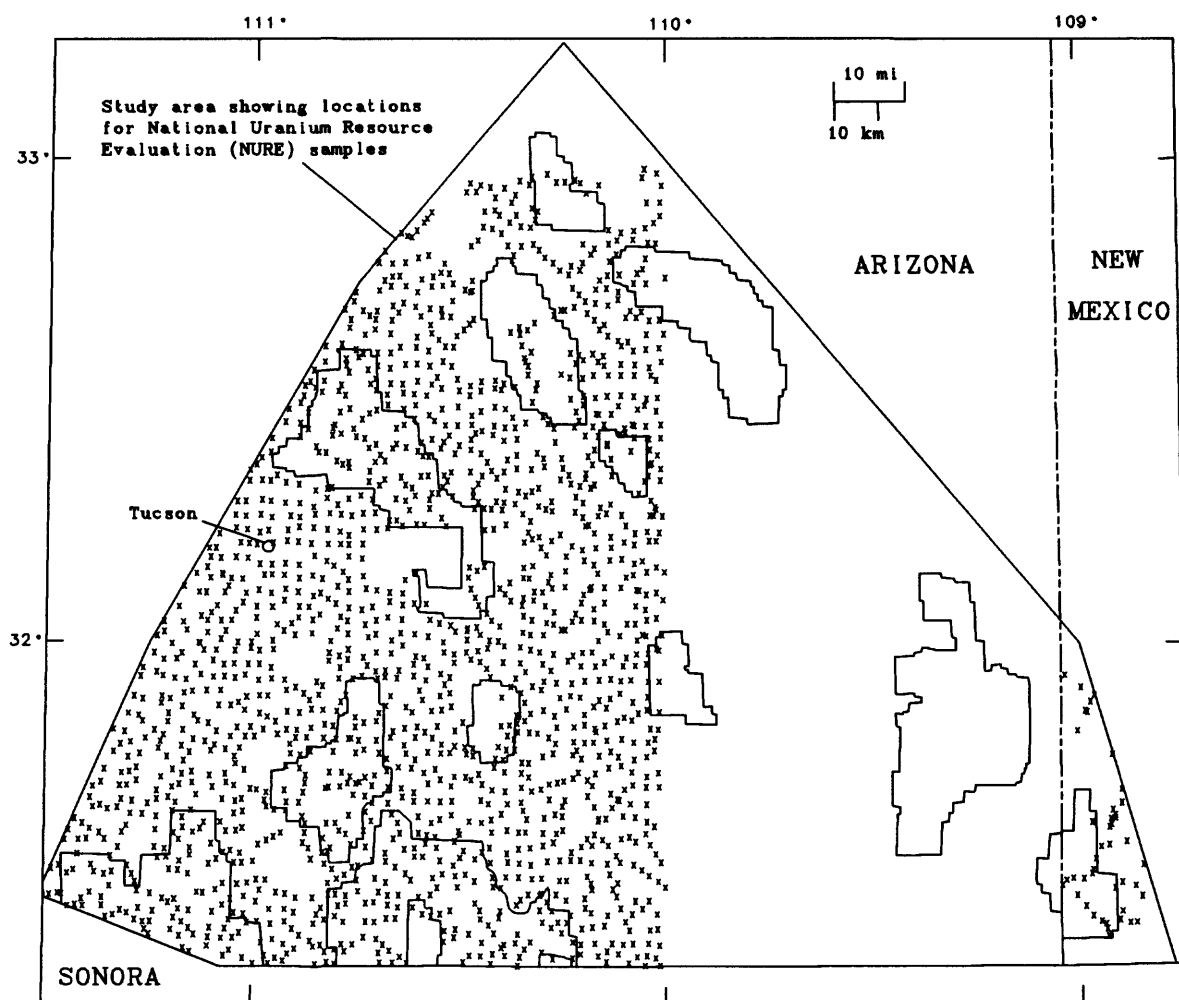


Figure 6.--Sampling locations for NURE samples