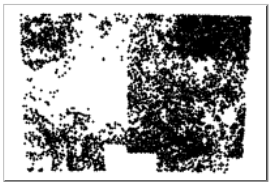
National Uranium Resource Evaluation (NURE) Hydrogeochemical Reconnaissance Data for the Navajo Nation



Data format: Shapefile

File or table name: NN_NURE_Water

Coordinate system: Geographic

Theme keywords: sediment, soil, groundwater, stream water, geochemistry, geochemical data, NURE

Abstract: This point shapefile is a subset of the US National dataset clipped to the area of the Navajo Nation. The National Uranium Resource Evaluation (NURE) program was initiated by the Atomic Energy Commission (now the Department of Energy; DOE) in 1973 with a primary goal of identifying uranium resources in the United States. The Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) program was one of nine components of NURE. Planned systematic sampling of stream sediments, soils, groundwater, and surface water over the entire United States began in 1975 under the responsibility of four DOE national laboratories: Lawrence Livermore Laboratory (LLL), Los Alamos Scientific Laboratory (LASL), Oak Ridge Gaseous Diffusion Plant (ORGDP), and Savannah River Laboratory (SRL). Each DOE laboratory developed its own sample collection, analytical, and data management methodologies and hired contractors to collect the samples. The NURE HSSR sampling program ended prematurely in 1980. The samples were analyzed and the resultant geochemical data were released on 9-track tapes and in a series of publications. By 1984, the NURE program was finished as Congressional funding disappeared. Out of a total of 625 2-degree quadrangles that cover the entire lower 48 States and Alaska, only 307 quadrangles were completely sampled and another 86 quadrangles were partially sampled. The HSSR data consisted of 894 separate data files stored on magnetic tape in 47 different file formats. The University of Oklahoma's Information Systems Programs of the Energy Resources Institute (ISP) was contracted by the Department of Energy to enhance the accessibility and usefulness of the NURE HSSR data. ISP created a single standard-format master file to replace 894 original files. ISP converted only 817 of the 894 original files before their funding ended. Unfortunately, this conversion process was never completed and introduced several systematic errors into the database. In 1985, the NURE HSSR sample archive, original field maps, field notes, and data tapes became the responsibility of the U.S. Geological Survey (USGS). A copy of the ISP-formatted NURE HSSR database was released as two CD-ROM publications (Hoffman and Buttleman, 1994; 1996). A new effort to recompile the NURE HSSR was begun by the USGS in 1995. All of the original 894 files have been examined, reformatted, and added to this USGS enhanced version of the NURE HSSR data. The data are contained in 2 major database files: one for water samples and one for sediment samples (which also includes soil and some rock samples.) An earlier version of this USGS enhanced version of the NURE HSSR data was released as an online Open-File Report at http://pubs.usgs.gov/of/1997/ofr-97-0492/ References Cited Hoffman, J.D., and Buttleman, Kim, 1994, National Geochemical Data Base: National Uranium Resource Evaluation data for the conterminous United States, with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-0018-A, CD-ROM. Hoffman, J.D., and Buttleman, Kim, 1996, National Geochemical Data Base: 1. National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) data for Alaska, formatted for GSSEARCH data base search software, 2. NURE HSSR data formatted as dBASE files for Alaska and the conterminous United States, 3. NURE HSSR data as originally compiled by the Department of Energy for Alaska and the conterminous United States, with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-0018-B, CD-ROM.

FGDC and ESRI Metadata:

Metadata elements shown with blue text are defined in the Federal Geographic Data Committee's (FGDC) *Content Standard for Digital Geospatial Metadata (CSDGM)*. Elements shown with green text are defined in the *ESRI Profile of the CSDGM.* Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

Identification Information:

Citation:
Citation information:
Originators: U.S. Geological Survey

Title:
National Uranium Resource Evaluation (NURE) Hydrogeochemical Reconnaissance Data for the Navajo Nation
***File or table name:** NN_NURE_Water

Publication date: 2004
***Geospatial data presentation form:** vector digital data

Publication information:
Publication place: Denver, CO
Publisher: U.S. Geological Survey

***Online linkage:** \\Terra_dc\Navajo\NAUM_NN_Summary\DB\Sampling\NN_NURE_Water.shp

Larger work citation:
Citation information:
Originators: Smith, Steven M.

Title:
National Geochemical Database: Reformatted Data from the National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) Program

Publication date: 1997
Edition: Version 1.40
Geospatial data presentation form: tabular digital data

Series information:
Series name: U.S. Geological Survey Open-File Report
Issue identification: 97-492

Online linkage: http://pubs.usgs.gov/of/1997/ofr-97-0492/

Description:

Abstract:

This point shapefile is a subset of the US National dataset clipped to the area of the Navajo Nation.

The National Uranium Resource Evaluation (NURE) program was initiated by the Atomic Energy Commission (now the Department of Energy; DOE) in 1973 with a primary goal of identifying uranium resources in the United States. The Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) program was one of nine components of NURE. Planned systematic sampling of stream sediments, soils, groundwater, and surface water over the entire United States began in 1975 under the responsibility of four DOE national laboratories: Lawrence Livermore Laboratory (LLL), Los Alamos Scientific Laboratory (LASL), Oak Ridge Gaseous Diffusion Plant (ORGDP), and Savannah River Laboratory (SRL). Each DOE laboratory developed its own sample collection, analytical, and data management methodologies and hired contractors to collect the samples.

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In 1985, the NURE HSSR sample archive, original field maps, field notes, and data tapes became the responsibility of the U.S. Geological Survey (USGS). A copy of the ISP-formatted NURE HSSR database was released as two CD-ROM publications (Hoffman and Buttleman, 1994; 1996).

A new effort to recompile the NURE HSSR was begun by the USGS in 1995. All of the original 894 files have been examined, reformatted, and added to this USGS enhanced version of the NURE HSSR data. The data are contained in 2 major database files: one for water samples and one for sediment samples (which also includes soil and some rock samples.) An earlier version of this USGS enhanced version of the NURE HSSR data was released as an online Open-File Report at http://pubs.usgs.gov/of/1997/ofr-97-0492/

References Cited

Hoffman, J.D., and Buttleman, Kim, 1994, National Geochemical Data Base: National Uranium Resource Evaluation data for the conterminous United States, with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-0018-A, CD-ROM.

Hoffman, J.D., and Buttleman, Kim, 1996, National Geochemical Data Base: 1. National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) data for Alaska, formatted for GSSEARCH data base search software, 2. NURE HSSR data formatted as dBASE files for Alaska and the conterminous United States, 3. NURE HSSR data as originally compiled by the Department of Energy for Alaska and the conterminous United States, with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-0018-B, CD-ROM.

Purpose:

The NURE HSSR samples were collected specifically to explore the United States for undiscovered uranium resources. Initially, the samples were only analysed for uranium contents but a due to a change in policy, most samples were eventually analyzed for as many as 45 different constituents. Although the data were originally intended for mineral exploration purposes, these data have also found application in the fields of earth science, ecology, environmental geochemistry, health, and medical geology. Since all of the samples were collected and analyzed within a short period of time (1975-1980) they represent a snapshot or a baseline of geochemical conditions during that period. Some of the sampled sites may no longer be accessible for resampling due to continued urban and industrial development.

Supplemental information:

More information about the NURE HSSR program, the sampling protocols and manuals, analytical methods, individual studies, data, reformatting procedures, and interpretive reports can be found in Smith (1997) at http://pubs.usgs.gov/of/1997/ofr-97-0492/ and in individual NURE GJBX, GJQ, and PGJ/F series publications from the Department of Energy. (See http://pubs.usgs.gov/of/1997/ofr-97-0492/faq_nure.htm#q13 for information on how to obtain NURE publications.)

Smith, S.M., 2001, National Geochemical Database: Reformatted data from the National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) Program, Version 1.30: U.S. Geological Survey Open-File Report 97-492, WWW release only, URL: http://pubs.usgs.gov/of/1997/ofr-97-0492/index.html

*__Language of dataset:__ en

Time period of content:

Time period information:

Range of dates/times:

Beginning date: 1975
Ending date: 1980

Currentness reference:

publication date

Status:

Progress: In work
Maintenance and update frequency: As needed. The NURE HSSR sediment and water databases are completed and will only experience minor changes as errors are noted and fixed. The most common change will probably be the addition of coordinates to a number of previously unlocated samples.

Spatial domain:

Bounding coordinates:

*__West bounding coordinate:__ -113.491702
*__East bounding coordinate:__ -106.006770
*__North bounding coordinate:__ 38.503077
*__South bounding coordinate:__ 33.358373

Local bounding coordinates:

*__Left bounding coordinate:__ -113.491702
*__Right bounding coordinate:__ -106.006770
*__Top bounding coordinate:__ 38.503077
*__Bottom bounding coordinate:__ 33.358373

Keywords:

Theme:

Theme keywords: sediment, soil, groundwater, stream water, geochemistry, geochemical data, NURE
Theme keyword thesaurus: None

Place:

Place keywords: United States of America
Place keyword thesaurus: None

Temporal:
Temporal keywords: 1975 to 1980
Temporal keyword thesaurus: None

Access constraints: None
Use constraints:
None

Point of contact:
Contact information:
Contact person primary:
Contact person: Smith, Steven M.
Contact organization: U.S. Geological Survey

Contact address:
Address type: Mailing address
Address:
Box 25046, MS 973
Denver Federal Center
City: Denver
State or province: Colorado
Postal code: 80225-0046
Country: United States of America

Contact voice telephone: 1-303-236-1192
Contact facsimile telephone: 1-303-236-3200

Contact electronic mail address: smsmith@usgs.gov

Data set credit:
The reformatting effort for the USGS enhanced version of the NURE HSSR database was done by Steven M. Smith, Andrew W. Holt, and Bryan G. Moravec. This effort was aided greatly by the earlier work of James D. Hoffman in obtaining, reading, converting, and preserving the original NURE files found on deteriorating 9-track magnetic tapes.

***Native dataset format:** Shapefile
***Native data set environment:**
Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.1.0.780

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Data Quality Information:

Attribute accuracy:
Attribute accuracy report:
The site and sample description parameters were recorded on preprinted field forms by the individual collectors working for sub-contractors. Many of these parameters required critical judgement by the collector or information obtained from the landowner or resident. The accuracy of site and sample description parameters varies with the Dept. of Energy Laboratory responsible for the regional sampling program, the study, the subcontractor, and the individual sample collector.

The samples in this dataset were chemically analyzed by several laboratories using a variety of techniques that changed over time. The accuracy of the geochemical data varies with the laboratory, the study, the analytical methodology, the element, and with the concentration of the element being analyzed. Values that were less than the lower detection limits of an analytical method were reported as a negative number: A value of -2 in the AG_PPM field is equivalent to <2 ppm Ag.

Logical consistency report:
The responsibility for the NURE HSSR program was given to four U.S. Dept. of Energy Laboratories. Each lab was assigned a region of the United States and given the authority to develop their own collection, analytical, and data management methodologies. This decision resulted in the creation of several different sample collection manuals, preprinted sample collection note forms, analytical methods, and data report formats. Thus there is a large amount of inconsistency in reported data between laboratories; especially in the site and sample description fields. Program changes over time also introduced additional inconsistencies, even within data reports from a single laboratory.

One of the primary goals of this reformatting effort has been the elimination of as many inconsistencies as possible. These problems with consistency fall into at least 7 categories. The following describes each category of consistency problem and the formatting process used to resolve the issue. Many database fields had some combination of these consistency problems.

1) A common parameter was recorded using different format styles. As an example, all four labs reported the sample collection date in differing formats (March 5, 1976 was reported as 03/05/76, 3/ 5/76, 3/05/76, 030576, 760305, or 76 3 5). All of these have been changed to a consistent format for every record (1976/03/05).

2) A common parameter was recorded using different units of measure. For example, in sediment data the concentration of magnesium (Mg) was originally reported in percent or parts-per-million (ppm) or parts-per-billion (ppb). In these cases, all values were converted to a common unit: All Mg values in the sediment database are now reported in percent. This same issue was also found and resolved for measurement parameters that were originally recorded either in feet or meters.

3) A common descriptive parameter was recorded on sample collection note forms and entered into the database using different coding schemes with differing lists of choices. An example of this problem is illustrated by the SEDTYPE field, which describes the dominant type of sediment found at the sample site. The choice of 'sand' was recorded as a code '4' by two sample collection forms, a code '3' by one, and a code 'S' by another. 'Muck' was recorded as a code '5', '6', or '7' depending upon the responsible lab, but was not even an available choice for sample collectors for a fourth lab. A code for 'mud' was available on only one sample collection form. This issue was resolved by replacing all codes with the corresponding defined value of 'SAND', 'MUCK', 'MUD', and so on. However, since all values were not available to all of the sample collectors, fields with this problem will not be entirely consistent.

4) A descriptive parameter was not recorded by all of the responsible laboratories. This is a very common problem. There are very few descriptive parameter fields that were actually used and recorded for all samples. Whereas the water temperature at the site was recorded on all sample collection field forms, only forms from two labs recorded air temperature, and only one lab recorded the percentage of organic material in the sample. Thus these fields are incompletely populated and consistent only for the laboratories that reported data.

5) A common parameter was given slightly different definitions by individual laboratories. For example, all of the labs recorded information about possible contamination sources at the sample site but each lab defined what constituted a contaminant source in a slightly different way. For fields with this problem, the original value was preserved in the field and the individual definitions were recorded in the documentation for that field.

6) A descriptive parameter called for the subjective judgement of the sample collector. Several sample description note forms included parameters that are inherently subjective. Parameters such as sample color, vegetation density, and contaminant sources are likely to have a lot of variation depending upon the skill and consistency of each individual sampler. Subjective color identifications between observation are often inconsistent for a single person and even more so for multiple people. These variations can be observed in the database between samplers within the same area. A similar inconsistency is found in the quality and quantity of sample site comments recorded on sample collection forms. Inconsistencies of this sort could not and were not addressed during the reformatting effort. The values given in the database are the original values recorded by the person or persons responsible for collecting the sample.

7) Two or more descriptive parameters for a single sample appear to contain contradictory information. For example, the sample may be described as a 'DRY' stream sediment collected from stream with a water depth of 1 ft. This type of inconsistency is common. It may be due to sampler error, data entry error, or situations that could not be adequately described with the parameter choices available. Most of these inconsistencies were left in the database. In a few cases, values for parameters that were clearly impossible were removed (such as a well depth value for a stream sediment). Whenever an offending value was removed from a record, that event and the original value was recorded in the REFORMAT comment field.

More information about possible inconsistencies within any database field is available in the Manual for Interpreting NURE HSSR Data at <http://tin.er.usgs.gov/nure/sediment/NURE_Manual.shtml>

Completeness report:

This dataset provides chemical data for Ag, Al, As, Au, B, Ba, Be, Bi, Br, Ca, Cd, Ce, Cl-, Co, Cr, Cs, Cu, Cy, Eu, F, Fe, Ga, He, Hf, Hg, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Pt, Rb, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Th, Ti, U, V, W, Y, Yb, Zn, Zr, PO4 (phosphate), NO3 (nitrite), SO4 (sulfate), methane, ethane, propane, and butane in samples of stream sediment, spring sediment, lake or pond sediment, soil, rock, well water, stream water, and spring water. In addition, the dataset provides location and descriptive information for each sample.

No sample contains data in all of the descriptive fields or in all of the chemical data fields. Additionally, no descriptive field or chemical data field is completely populated within the NURE HSSR dataset. The amount of data in descriptive fields varies with the DOE Laboratory that was responsible for sample collection. The amount of data in elemental fields varies with the responsible DOE Laboratory and with the analytical methods used.

Descriptions of the sample collection protocols, preprinted sample field note forms, and analytical methods are found in the following publications.

Lawrence Livermore Laboratory:

Lawrence Livermore Laboratory, 1976, Hydrogeochemical and stream-sediment survey of the National Uranium Resource Evaluation (NURE) program - western United States; quarterly progress report, April through June 1976: Lawrence Livermore Laboratory UCID-16911-76-2, University of California, Livermore, Calif., U.S. Department of Energy, Grand Junction, Colo., GJBX-59(76), 71 p.

Lawrence Livermore Laboratory, 1977, Hydrogeochemical and stream-sediment survey of the National Uranium Resource Evaluation (NURE) program - western United States; quarterly progress report, January through March 1977: Lawrence Livermore Laboratory UCID-16911-77-1, University of California, Livermore, Calif., U.S. Department of Energy, Grand Junction, Colo., GJBX-53(77), 15 p.

Lawrence Livermore Laboratory, 1977, Hydrogeochemical and stream-sediment survey of the National Uranium Resource Evaluation (NURE) program - western United States; quarterly progress report, July through September 1976: Lawrence Livermore Laboratory UCID-16911-76-3, University of California, Livermore, Calif., U.S. Department of Energy, Grand Junction, Colo., GJBX-10(77), 44 p.

Puchlik, K.P., 1977, Collection of wet and dry stream-sediment samples, in Symposium on Hydrogeochemical and Stream-Sediment Reconnaissance for Uranium in the United States: U.S. Department of Energy, Grand Junction, Colo., GJBX-77(77), p. 297-300.

Los Alamos Scientific Laboratory:

Sharp, R.R., Jr., and Aamodt, P.L., 1978, Field procedures for the uranium hydrogeochemical and stream sediment reconnaissance as used by the Los Alamos Scientific Laboratory: Los Alamos Scientific Laboratory manual LA-7054-M, Los Alamos, N.M., U.S. Department of Energy, Grand Junction, Colo., GJBX-68(78), 64 p.

Oak Ridge Gaseous Diffusion Plant:

Arendt, J.W., Butz, T.R., Cagle, G.W., Kane, V.E., and Nichols, C.E., 1979, Hydrogeochemical and stream sediment reconnaissance procedures of the Uranium Resource Evaluation project: Union Carbide Corporation, Nuclear Division, Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn., K/UR-100, U.S. Department of Energy, Grand Junction, Colo., GJBX-32(80), 55 p.

Uranium Resource Evaluation Project, 1978, Procedures manual for groundwater reconnaissance sampling: Union Carbide Corporation, Nuclear Division, Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn., K/UR-12, U.S. Department of Energy, Grand Junction, Colo., GJBX-62(78), 57 p.

Uranium Resource Evaluation Project, 1978, Procedures manual for stream sediment reconnaissance sampling: Union Carbide Corporation, Nuclear Division, Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn., K/UR-13, U.S. Department of Energy, Grand Junction, Colo., GJBX-84(78), 56 p.

Uranium Resource Evaluation Project, 1982, Supplement to hydrogeochemical and stream sediment reconnaissance basic data reports K/UR-405 and K/UR-408 through K/UR-443 [GJBX-52(82) through GJBX-88(82)]: Union Carbide Corporation, Nuclear Division, Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn., K/UR-412, U.S. Department of Energy, Grand Junction, Colo., GJBX-51(82), 25 p.

Savannah River Laboratory:

Ferguson, R.B., Price, Van, and Baucom, E.I., 1976, Field manual for stream sediment reconnaissance: E.I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., SRL Internal Doc. DPST-76-358, U.S. Department of Energy, Grand Junction, Colo., GJBX-30(77), 56 p.

Ferguson, R.B., Price, Van, and Baucom, E.I., 1977, Field manual for ground water reconnaissance: E.I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., SRL Internal Doc. DPST-76-416, U.S. Department of Energy, Grand Junction, Colo., GJBX-26(77), 70 p.

Ferguson, R.B., Price, Van, and Baucom, E.I., 1977, Field manual for stream water and sediment reconnaissance: E.I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., SRL Internal Doc. DPST-76-363, U.S. Department of Energy, Grand Junction, Colo., GJBX-80(77), 78 p.

Price, Van, and Jones, P.L., 1979, Training manual for water and sediment geochemical reconnaissance: E.I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., SRL Internal Doc. DPST-79-219, U.S. Department of Energy, Grand Junction, Colo., GJBX-420(81), 104 p.

NURE project:

Bolivar, S.L., 1980, An overview of the National Uranium Resource Evaluation Hydrogeochemical and Stream Sediment Reconnaissance Program: Los Alamos Scientific Laboratory informal report LA-8457-MS, Los Alamos, N.M., U.S. Department of Energy, Grand Junction, Colo., GJBX-220(80), 24 p.

Grimes, J.G., 1984, NURE HSSR geochemical sample archives transfer report - geochemical analysis: Martin Marietta Energy Systems, Inc., Oak Ridge Gaseous Diffusion Plant, Oak Ridge, Tenn., K/UR-500, Part 3, 150 p.

Information Systems Programs, Energy Resources Institute, 1985, A technical history of the NURE HSSR program: Norman, Oklahoma, University of Oklahoma, U.S. Department of Energy, Grand Junction, Colo., GJBX-2(85), 58 p.

Positional accuracy:

Horizontal positional accuracy:

Horizontal positional accuracy report:

The latitude-longitude coordinates for sample locations were determined by digitizing sites from maps of various scales and sources. For most the United States the maps were USGS 1:24,000-scale, 1:62,500-scale, or 1:63,360-scale topographic quadrangles. In the eastern quarter of the U.S. that was sampled by Savannah River Laboratory subcontractors, county highway maps of various scales and quality were the main source of maps used for locating sites. The accuracy is dependent upon the scale and quality of the map from which the location was determined as well as the care taken by the individual responsible for digitizing. Latitude-longitude coordinates were reported as decimal degrees. All labs except for the Oak Ridge Gaseous Diffusion Plant (ORGDP) reported coordinates with 4 decimal places implying an accuracy to within 11 meters (36 feet). ORGDP reported coordinates only to 3 decimal places with an implied accuracy of 110 meters (360 feet).

The USGS topographic maps, from which latitude and longitude coordinates were determined, use the 1927 North American Datum (NAD27) based on the Clarke 1866 ellipsoid. Most county highway maps do not identify the projection, datum, or ellipsoid used. It is assumed that coordinates on these maps are also derived from NAD27 and the Clarke 1866 ellipsoid.

Coordinates for a small percentage of samples are either missing or obviously incorrect. In both cases, the latitude and/or longitude fields were populated with a value of 0 (zero) and any known information about the location, including the incorrect values, were recorded in the COORDPRB comment field during the reformatting process. Some, but not all, of the missing or incorrect coordinates have been recovered from original field maps. More of these problem locations may be fixed at a later date.

Lineage:

Process step:

Process description:

The NURE HSSR data were originally generated by four Department of Energy Laboratories (Lawrence Livermore Laboratory (LLL), Los Alamos Scientific Laboratory (LASL), Oak Ridge Gaseous Diffusion Plant (ORGDP), and Savannah River Laboratory (SRL)) and at least one unspecified subcontractor laboratory. These data were determined from samples collected between 1975 and 1980. The analytical determinations were completed between 1975 and 1982. The data were originally released in published GJBX-series reports and as digital data files on 9-track magnetic tape by study area, quadrangle and/or state. When finished, the NURE HSSR database consisted of at least 847 different files in 49 different digital formats.

Process time: 1975 to 1982

Process step:

Process description:

In 1982, the Information Systems Program (ISP) of the Energy Resources Institute at the University of Oklahoma was contracted to "enhance the accessibility and usefulness" of the NURE HSSR data. ISP created a new standard format database file and converted 817 of the original NURE HSSR files to this format.

Process time: 1982 to 1985

Process step:

Process description:

In 1985, the responsibility for the NURE HSSR data was transferred from the Department of Energy to the U.S. Geological Survey. The data were downloaded from magnetic tapes and then re-released as a series of CD-ROM publications. All of these CD-ROM publications utilized the NURE HSSR database that had been compiled by the Information Systems Program (ISP) of the Energy Resources Institute at the University of Oklahoma. The final CD-ROM (Hoffman and Buttleman, 1996) also included a subdirectory with all of the original NURE HSSR files archived in a compressed format.

Hoffman, J.D., Gunnells, G.B., and McNeal, J.M., 1991, National Geochemical Data Base; National Uranium Resource Evaluation data for the conterminous western United States: U.S. Geological Survey Digital Data Series DDS-1, CD-ROM (Superceded by DDS-18-A).

Hoffman, J.D., and Buttleman, Kim, 1994, National Geochemical Data Base; National Uranium Resource Evaluation data for the conterminous United States, with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-18-A, CD-ROM.

Hoffman, J.D., and Buttleman, Kim, 1996, National Geochemical Data Base; 1. National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance (HSSR) data for Alaska, forrmatted for GSSEARCH data base search software; 2. NURE HSSR data formatted a dBASE files for Alaska and the conterminous United States; 3. NURE HSSR data as originally compiled by the Department of Energy for Alaska and the conterminous United States; with MAPPER display software by R.A. Ambroziak and MAPPER documentation by C.A. Cook: U.S. Geological Survey Digital Data Series DDS-18-B, CD-ROM.

Process time: 1985 to 1996

Process step:

Process description:

Use of the ISP-compiled version of the NURE HSSR database revealed several inconsistencies, some introduced systematic errors, duplicated records, and missing data. Beginning in 1994, efforts to use large amounts of NURE HSSR data from the state of Montana led to a decision to recompile the NURE HSSR data from the original files. The success of this task led to a larger project with the goal of reformatting the entire NURE HSSR database.

A new comprehensive database structure was created after examining the ISP database structure, each of the laboratory sampling manuals, the field sampling note forms, and the GJBX-3(84) publication (Zinkl, R.J., and Brock, D.S., 1984, User's guide to NURE HSSR tape formats: Report of Bendix Field Engineering Corporation prepared for the U.S. Department of Energy, Grand Junction, Colo., GJBX-3(84), 168 p.) It was also determined that the data were easier to compile and use if separated into a sediment dataset and a water dataset.

Reformatting began with data from 2-degree quadrangles in Montana and then proceeded, quadrangle-by-quadrangle, across the conterminous U.S. and Alaska. The original NURE HSSR files were obtained from a subdirectory on the Hoffman and Buttleman (1996) CD-ROM. For each quadrangle, all of the original files were first compared with the corresponding GJBX-series data release and data interpretation publications. Data missing in the digital files were added from the hard copy publications. The data were then reformatted and compiled. Often multiple files from a quadrangle contained records for the same sample. These records were compared and, when possible, combined into single records per sample. Additional data, not included in the original data formats, were also added to the database records based on the information found in the publications; including quadrangle names and analytical methods. Occasionally, it was necessary to check original field notes and maps to resolve problems but this was not done systematically.

Finally, a summary was written for each quadrangle that included descriptions of each NURE study in the quadrangle; information about the samples collected and analytical methods used; a brief description of how the data were processed during the reformatting phase; notes about known inconsistencies or potential problems; indications of other known but unobtained sources of NURE-related geochemical data; and a quadrangle bibliography. These NURE HSSR quadrangle summaries are published online at <http://pubs.usgs.gov/of/1997/ofr-97-0492/index.html>.

Process date: 1994 to present

Process step:

Process description:

For the sediment data:

Added, corrected, or confirmed coordinates for 9,949 samples based on the re-digitizing of selected original field maps or from researching published tables. Updated comments in COORDPRB and REFORMAT fields and values in FIPS, HUC8, LS_MAP, and QUAD based

on the new coordinates. Standardized or corrected several comments in the REFORMAT field. Removed 16 duplicated records.

For the water data:

Added, corrected, or confirmed coordinates for 11,542 samples based on the re-digitizing of selected original field maps or from researching published tables. Updated comments in COORDPRB and REFORMAT fields and values in FIPS, HUC8, LS_MAP, QUAD, and STATE based on the new coordinates. Standardized or corrected several comments in the REFORMAT field.

Process date: 20060324

Process contact:
Contact information:
Contact person primary:
Contact person: Steven M Smith
Contact organization: USGS CR GD
Contact position: Geologist

Contact address:
Address type: mailing address
Address:
Box 25046
City: Denver
State or province: CO
Postal code: 80225-0046
Country: USA

Contact voice telephone: 303-236-1192
Contact facsimile telephone: 303-236-3200

Contact electronic mail address: smsmith@usgs.gov

Process step:
Process description:
Downloaded the US National dataset from http://tin.er.usgs.gov/. Clipped to the area of the Navajo Nation, and projected to Geographic, NAD83.

Process software and version: ESRI ArcGIS 9.1
Process date: July 2007

Source used citation abbreviation:
S:\NAUM_NN_Summary\Work\Sampling\nurehssr.xml

Process contact:
Contact information:
Contact organization primary:
Contact organization: TerraSpectra Geomatics

Contact address:
Address type: mailing and physical address
Address:
2700 E Sunset Rd, Ste A-10
City: Las Vegas
State or province: NV
Postal code: 89120
Country: USA

Contact voice telephone: 702-795-8254

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Spatial Data Organization Information:

*__Direct spatial reference method:__ Vector

Point and vector object information:
SDTS terms description:
*__Name:__ NN_NURE_Water
*__SDTS point and vector object type:__ Entity point
*__Point and vector object count:__ 11257

ESRI terms description:
*__Name:__ NN_NURE_Water
*__ESRI feature type:__ Simple
*__ESRI feature geometry:__ Point
*__ESRI topology:__ FALSE
*__ESRI feature count:__ 11257
*__Spatial index:__ TRUE
*__Linear referencing:__ FALSE

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Spatial Reference Information:

Horizontal coordinate system definition:
Coordinate system name:
*__Geographic coordinate system name:__ GCS_North_American_1983

Geographic:
- **Latitude resolution:** 0.000000
- **Longitude resolution:** 0.000000
- **Geographic coordinate units:** Decimal degrees

Geodetic model:
- **Horizontal datum name:** North American Datum of 1983
- **Ellipsoid name:** Geodetic Reference System 80
- **Semi-major axis:** 6378137.000000
- **Denominator of flattening ratio:** 298.257222

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Entity and Attribute Information:

Detailed description:
- **Name:** NN_NURE_Water

Entity type:
- **Entity type label:** NN_NURE_Water
- **Entity type type:** Feature Class
- **Entity type count:** 11257

Attribute:
- **Attribute label:** FID
- **Attribute alias:** FID
- **Attribute definition:**
  Internal feature number.
- **Attribute definition source:**
  ESRI
- **Attribute type:** OID
- **Attribute width:** 4
- **Attribute precision:** 0
- **Attribute scale:** 0

Attribute domain values:
- **Unrepresentable domain:**
  Sequential unique whole numbers that are automatically generated.

Attribute:
- **Attribute label:** Shape
- **Attribute alias:** Shape
- **Attribute definition:**
  Feature geometry.
- **Attribute definition source:**
  ESRI
- **Attribute type:** Geometry
- **Attribute width:** 0
- **Attribute precision:** 0
- **Attribute scale:** 0

Attribute domain values:
- **Unrepresentable domain:**
  Coordinates defining the features.

Attribute:
- **Attribute label:** REC_NO
- **Attribute alias:** REC_NO
- **Attribute type:** String
- **Attribute width:** 8

Attribute:
- **Attribute label:** PRIME_ID
- **Attribute alias:** PRIME_ID
- **Attribute type:** String
- **Attribute width:** 9

Attribute:
- **Attribute label:** DOELAB
- **Attribute alias:** DOELAB
- **Attribute type:** String
- **Attribute width:** 5

Attribute:
- **Attribute label:** LATITUDE
- **Attribute alias:** LATITUDE
- **Attribute type:** Number
- **Attribute width:** 19
- **Attribute number of decimals:** 5

Attribute:
- **Attribute label:** LONGITUDE
- **Attribute alias:** LONGITUDE
- **Attribute type:** Number
- **Attribute width:** 19

*Attribute number of decimals: 5

Attribute:
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*Attribute width: 2

Attribute:
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*Attribute width: 2

Attribute:
*Attribute label: SAMPSRC
*Attribute alias: SAMPSRC

*Attribute type: String
*Attribute width: 15

Attribute:
*Attribute label: SMPTREAT
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*Attribute type: String
*Attribute width: 35

Attribute:
*Attribute label: SAMPDAT
*Attribute alias: SAMPDAT

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Attribute:
*Attribute label: WTRTEMP
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*Attribute number of decimals: 5

Attribute:
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*Attribute alias: PH

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*Attribute width: 19
*Attribute number of decimals: 5

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Attribute:
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*Attribute number of decimals: 5

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*Attribute alias: B_PPB

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Attribute:
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Attribute:
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Attribute:
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*Attribute alias: U_DN_PPB

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*Attribute width: 19
*Attribute number of decimals: 5

Attribute:
*Attribute label: U_FL_PPB
*Attribute alias: U_FL_PPB

*Attribute type: Number
*Attribute width: 19
*Attribute number of decimals: 5

Attribute:
*Attribute label: METHODS
*Attribute alias: METHODS

*Attribute type: String
*Attribute width: 40

Overview description:

Entity and attribute overview:

The data set contains 226 different attributes in two tables, a sediment table and a water table. These are documented in detail in a database manual. The following list shows, by general category, the attribute labels, the dataset (sediment, water, or both), type, width and precision, and a short description of the field.

```
> Sample identification
>     REC_NO  Both      Text      8    A sequential record number assigned during reformatting process
>   PRIME_ID  Both      Text      9    Primary laboratory sample identification number
>      REPLC  Both      Text      3    Replicate code
>     DOELAB  Both      Text      5    Department of Energy (DOE) laboratory responsible for collecting and analyzing the sample
>     LASLID  Both      Text      6    Los Alamos Scientific Laboratory site identification number
>     ORNLID  Both      Text      7    Oak Ridge Gaseous Diffusion Plant sample number
>      SRLID  Both      Text      9    Savannah River Laboratory sample number
>      LLLID  Both      Text      8    Lawrence Livermore Laboratory sample number
>       SITE  Both      Text      8    Additional site number (Definition of field varies slightly with lab responsible for the sample)
>
> Geographic location
>        LAT  Both      Real     10.4  Latitude in decimal degrees (NAD27, Clarke 1866)
```

>	LONG	Both	Real	10.4	Longitude in decimal degrees (negative = west; NAD27, Clarke 1866)
>	STATE	Both	Text	2	State in which the sample was collected (Post office abbreviation)
>	QUAD	Both	Text	25	The name of the USGS 1° by 2° quadrangle in which the sample was reported collected
>	MAPCODE	Both	Text	6	Alphanumeric NTMS map code for the USGS 1° by 2° quadrangle (incompletely populated and not diagnostic)
>	FIPS	Both	Text	5	FIPS code of county and state calculated from geographic coordinates
>	HUC8	Both	Text	8	8-Digit Hydrologic Unit Code calculated from geographic coordinates
>	LS_MAP	Both	Text	9	Hierarchical code that identifies different scale USGS quadrangles calculated from geographic coordinate
>	STUDY	Both	Text	4	A code that identifies the Pilot/Orientation study or Detailed Study for which the sample was collected
>	PHASE	Both	Text	1	Sampling phase
>	STRBASIN	Both	Text	11	Drainage basin identification number and stream order
>	B_LAT_C	Both	Real	10.4	Latitude of basin centroid
>	B_LONG_C	Both	Real	10.4	Longitude of basin centroid
>	COORDPRB	Both	Text	250	Comments added during the reformatting process to document problems specifically with latitude and longitude coordinates in the recor
>					
>	Processing information				
>	SPECMS	Both	Text	1	An indicator for when special measurements were recorded for a sample site
>	TAPEDATA	Both	Text	6	Tape release data
>	ANALDATE	Both	Text	10	Date on which the multielement analysis was completed
>	BATCH_ES	Both	Text	5	ORGDP analytical laboratory batch number for multielement emission spectroscopy analyses
>	ASBATCH	Both	Text	5	ORGDP analytical laboratory batch number for arsenic and selenium analyses
>	CLBATCH	Both	Text	5	ORGDP analytical laboratory batch number for chlorine and sulfate analyses
>	NO3BATCH	Water	Text	5	ORGDP analytical laboratory batch number for nitrate analyses
>	PO4BATCH	Both	Text	5	ORGDP analytical laboratory batch number for orthophosphate analyses
>	RNBATCH	Water	Text	5	ORGDP analytical laboratory batch number for radon analyses
>	HENBATCH	Water	Text	5	ORGDP analytical laboratory batch number for helium/neon ratios
>	SNBATCH	Sediment	Text	5	ORGDP analytical laboratory batch number for tin analyses
>	HGBATCH	Sediment	Text	5	ORGDP analytical laboratory batch number for mercury analyses
>	UBATCH_DN	Both	Text	5	ORGDP analytical laboratory batch number for delayed neutron counting uranium analyses
>	UBATCH_FL	Both	Text	5	ORGDP analytical laboratory batch number for fluorescence spectroscopy uranium analyses
>	UBATCH_MS	Both	Text	5	ORGDP analytical laboratory batch number for mass spectrometry uranium analyses
>	UBATCH_XX	Both	Sediment	5	ORGDP analytical laboratory batch number for extra or multiple uranium analyses
>	TAPEFILE	Both	Text	9	The original NURE tape name and file number used as the primary source of information for each record
>	REFORMAT	Both	Text	250	Comments added during the reformatting process to document problems, changes, additions, and data sources in the record
>					
>	Sample characteristics				
>	SAMPTYP	Both	Text	2	Sample type code that identifies the source, medium, and treatment of the sample
>	REC_CNT	Both	Integer	1	Multiple record counter that was incremented for additional records on a single sample
>	SMPMEDIA	Sediment	Text	10	Type of sample media that was collected and analyzed as derived from the SAMPTYP code
>	SAMPSRC	Both	Text	15	Source of the sample that was collected and analyzed as derived from the SAMPTYP code
>	SEDCOND	Sediment	Text	3	Condition (wet or dry) of sediment collected as derived from the SAMPTYP code
>	SIZEFRXN	Sediment	Text	15	Seive size fraction of the sediment material that was ultimately analyzed as derived from the SAMPTYP code
>	SMPTREAT	Water	Text	15	Field treatment of water samples with respect to acidification and filtering
>	OSAMPTYP	Both	Text	15	ORGDP sample type and sample source classification
>	LSAMPTYP	Both	Text	8	ORGDP Laboratory sample type classification
>	SSAMPTYP	Sediment	Text	23	Savannah River Laboratory sample type classification
>	SEDTREAT	Sediment	Text	6	Sediment sample treatment (apparently field pre-treatment information)
>	WTRTREAT	Water	Text	20	Water sample treatment (apparently field pre-treatment information)
>	SAMPDAT	Both	Text	10	Sample collection date, reformatted to YYYY/MM/DD
>	SAMPHR	Both	Text	2	Sample collection time rounded to the nearest whole hour (24-hour clock)
>	SAMPLER	Both	Text	3	Sampler initials or sampling team number (Definition of field varies slightly with lab responsible for the sample)
>	GRABS	Both	Text	2	Number of grabs or subsamples collected at a site to composite the sample
>					
>	Site characteristics				
>	WEATHER	Both	Text	26	A description of the prevalent weather conditions at the time of sampling
>	AIRTEMP	Both	Real	6.1	The air temperature measured at the sample site, reported in degrees Celsius
>	WTRTEMP	Both	Real	6.1	The water temperature measured at the sample site, reported in degrees Celsius
>	PH	Both	Real	4.1	The pH of water at the site as determined by a pH meter
>	PH_LOION	Water	Real	4.1	The pH of water at the site as determined by Lo-Ion paper
>	COND	Both	Real	9.2	The specific conductance measured in water at the site with a conductivity meter (in µmhos/cm)
>	LABCOND	Water	Real	9.2	The specific conductance measured in the water sample at the laboratory (in µmhos/cm)
>	ALK	Both	Real	8.2	Field measurement of the total alkalinity in water at the site (Definition, method, and reporting unit varies by lab)
>	ALKP	Water	Real	8.2	Field measurement of phenolphthalein alkalinity in water at the site (Definition and reporting unit varies by lab)
>	ALKM	Water	Real	8.2	Field measurement of ALKP plus remaining alkalinity in water at the site to get approximate total alkalinity (reporting units not cle
>	O_DISS	Both	Real	9.1	Amount of oxygen dissolved in water at site, reported in ppm
>	SCIN	Both	Real	10.4	Scintillometer measurement of the local gamma-ray activity at a sample site, expressed as equivalent uranium in ppm
>	ORGN_PCT	Both	Text	2	Field estimate of the percentage of organic material present in the sample
>	SAMPODOR	Both	Text	10	An indication of any odor from the sampled material
>	SMPCOLR	Both	Text	27	Color of sample material collected
>	SGEOUNIT	Both	Text	4	A two to four letter code that designates the formation name or the age of the surface bedrock at the sampling site
>	ROCKTYP	Both	Text	26	The predominant type of surficial bedrock in the vicinity of the sample site
>	ROCKCLR	Both	Text	10	Dominant color of local bedrock exposures
>	SEDTYPE	Both	Text	17	Type of dominant bed material or loose sediment at the sample site
>	SEDCOLR	Both	Text	10	Dominant color of loose sediment at sample site
>	STRWDTH	Both	Real	7.2	Estimated width of the stream at the sample site, in meters
>	STRWDTHC	Both	Text	10	Estimated width range (in feet) of the stream at the sample site
>	STRDPTH	Both	Real	7.2	Estimated depth of the stream at the sample site, in meters
>	STRDPTHC	Both	Text	10	Estimated depth range (in feet) of the stream at the sample site
>	WTRLEVEL	Both	Text	6	A field judgement of the water level at the sample site
>	STRFLOW	Both	Real	7.2	The average velocity of the stream flow reported in meters/second
>	STRFLOWC	Both	Text	8	A field judgement of the stream flow velocity at the sample site
>	WTRDCHRG	Water	Real	9.2	The discharge rate of the well or spring, in liters/minute
>	WTRCOLR	Both	Text	11	Amount and type of dissolved or suspended load in water at the site based on its color or appearance
>	VSBLDPTH	Water	Real	6.2	Depth of visibility estimated from water collected in a liter bottle and reported in meters
>	STRCHANL	Both	Text	10	A field judgement of the stream channel depositional character at the sample site when the sample was collected
>	VEGTYPE	Both	Text	19	Dominant type of vegetation in the area of the sampled location
>	VEGDENS	Both	Text	10	Density of plant cover at the sample site
>	RELIEF	Both	Text	23	An estimate of the relief or difference in elevation in the vicinity of the sample site (reported as a range in meters)
>	CONTAMC	Both	Text	45	A field judgement of possible contaminant sources or major activities near the sample site
>	WELLPUMP	Water	Text	17	Type of pump used to draw water from the sampled well
>	WELLTYPE	Water	Text	11	Type of well that was sampled
>	WELLUSE	Water	Text	40	Primary use of well
>	WELLUSE2	Water	Text	15	Most typical use of well water
>	WELLFREQ	Water	Text	27	Frequency of well pumping or use
>	WLSMPLOC	Water	Text	30	An indication of where in the water system a well water sample was collected
>	WLDIST_M	Water	Integer	4	An estimate of the distance from the well head to the location where the sample was collected, in meters
>	WELLPIPE	Water	Text	10	Composition of the pipe from which the well water sample was collected
>	WELLCASE	Water	Text	10	Composition of the well casing below the water table
>	WELLDIAM	Water	Integer	3	Inside diameter of the well casing, in inches
>	WELLDPTH	Water	Integer	6	Total drilled depth of well from the surface, in feet
>	WLDPTSRC	Water	Text	18	Source of total well depth (WELLDPTH) information
>	WLDPTCNF	Water	Text	14	An indication of the confidence in the accuracy of the total well depth (WELLDPTH) information
>	WWTRDPTH	Water	Integer	4	Depth from the ground surface to the water level in a well, in feet
>	WLPRDPTH	Water	Integer	6	Depth from the ground surface to the top of the producing horizon in the well, in feet
>	WLPDSRC	Water	Text	18	Source of information for the depth to top of producing horizon (WLPRDPTH) information
>	WLPDCNF	Water	Text	14	An indication of the confidence in the accuracy of the depth to top of producing horizon (WLPRDPTH) information
>	WELLAGE	Water	Integer	4	Age of the sampled well recorded to the nearest whole year
>	WLAGECNF	Water	Text	14	An indication of the confidence in the accuracy of the well age (WELLAGE) information
>	PUNIT	Water	Text	4	A 2 to 4 letter code that designates the formation name, aquifer name, or the age of the producing unit
>	PUNITSRC	Water	Text	18	Source of producing horizon geologic unit (PUNIT) information
>	PUNITCNF	Water	Text	14	An indication of the confidence in the accuracy of the producing horizon geologic unit (PUNIT) identification
>	COMMENTS	Both	Text	250	Sample collector's comments
>	COMMENT2	Both	Text	250	Sample collector's comments (continued)
>					
>	Chemical Analyses				
>	AG_PPB	Water	Real	12.4	Concentration of silver in water, in parts per billion
>	AG_PPM	Sediment	Real	12.4	Concentration of silver in sediments, in parts per million
>	AL_PPB	Water	Real	12.4	Concentration of aluminum in water, in parts per billion
>	AL_PCT	Sediment	Real	8.4	Concentration of aluminum in sediments, in percent
>	AS_PPB	Water	Real	12.4	Concentration of arsenic in water, in parts per billion
>	AS_PPM	Sediment	Real	12.4	Concentration of arsenic in sediments, in parts per million
>	AU_PPM	Sediment	Real	12.4	Concentration of gold in sediments, in parts per million
>	B_PPB	Water	Real	12.4	Concentration of boron in water, in parts per billion
>	B_PPM	Sediment	Real	12.4	Concentration of boron in sediments, in parts per million
>	BA_PPB	Water	Real	12.4	Concentration of barium in water, in parts per billion
>	BA_PPM	Sediment	Real	12.4	Concentration of barium in sediments, in parts per million
>	BE_PPB	Water	Real	12.4	Concentration of beryllium in water, in parts per billion
>	BE_PPM	Sediment	Real	12.4	Concentration of beryllium in sediments, in parts per million
>	BI_PPM	Sediment	Real	12.4	Concentration of bismuth in sediments, in parts per million
>	BR_PPB	Water	Real	12.4	Concentration of bromide ions in water, in parts per billion
>	BR_PPM	Sediment	Real	12.4	Concentration of bromine in sediments, in parts per million
>	CA_PPM	Water	Real	12.4	Concentration of calcium in water, in parts per million
>	CA_PCT	Sediment	Real	8.4	Concentration of calcium in sediments, in percent
>	CD_PPB	Water	Real	12.4	Concentration of cadmium in water, in parts per billion

>	CD_PPM	Sediment	Real	12.4	Concentration of cadmium in sediments, in parts per million
>	CE_PPB	Water	Real	12.4	Concentration of cerium in water, in parts per billion
>	CE_PPM	Sediment	Real	12.4	Concentration of cerium in sediments, in parts per million
>	CL_PPM	Both	Real	12.4	Concentration of chloride ions in water or sediments, in parts per million
>	CO_PPB	Water	Real	12.4	Concentration of cobalt in water, in parts per billion
>	CO_PPM	Sediment	Real	12.4	Concentration of cobalt in sediments, in parts per million
>	CR_PPB	Water	Real	12.4	Concentration of chromium in water, in parts per billion
>	CR_PPM	Sediment	Real	12.4	Concentration of chromium in sediments, in parts per million
>	CS_PPM	Sediment	Real	12.4	Concentration of cesium in sediments, in parts per million
>	CU_PPB	Water	Real	12.4	Concentration of copper in water, in parts per billion
>	CU_PPM	Sediment	Real	12.4	Concentration of copper in sediments, in parts per million
>	DY_PPB	Water	Real	12.4	Concentration of dysprosium in water, in parts per billion
>	DY_PPM	Sediment	Real	12.4	Concentration of dysprosium in sediments, in parts per million
>	EU_PPM	Sediment	Real	12.4	Concentration of europium in sediments, in parts per million
>	F_PPB	Water	Real	12.4	Concentration of fluoride ions in water, in parts per billion
>	F_PPM	Sediment	Real	12.4	Concentration of fluorine in sediments, in parts per million
>	FE_PPB	Water	Real	12.4	Concentration of iron in water, in parts per billion
>	FE_PCT	Sediment	Real	8.4	Concentration of iron in sediments, in percent
>	HE_PPM	Water	Real	12.4	Concentration of helium in water, in parts per million
>	HF_PPM	Sediment	Real	12.4	Concentration of hafnium in sediments, in parts per million
>	HG_PPM	Sediment	Real	12.4	Concentration of mercury in sediments, in parts per million
>	K_PPM	Water	Real	12.4	Concentration of potassium in water, in parts per million
>	K_PCT	Sediment	Real	8.4	Concentration of potassium in sediments, in percent
>	LA_PPM	Sediment	Real	12.4	Concentration of lanthanum in sediments, in parts per million
>	LI_PPB	Water	Real	12.4	Concentration of lithium in water, in parts per billion
>	LI_PPM	Sediment	Real	12.4	Concentration of lithium in sediments, in parts per million
>	LU_PPM	Sediment	Real	12.4	Concentration of lutetium in sediments, in parts per million
>	MG_PPM	Water	Real	12.4	Concentration of magnesium in water, in parts per million
>	MG_PCT	Sediment	Real	8.4	Concentration of magnesium in sediments, in percent
>	MN_PPB	Water	Real	12.4	Concentration of manganese in water, in parts per billion
>	MN_PPM	Sediment	Real	12.4	Concentration of manganese in sediments, in parts per million
>	MO_PPB	Water	Real	12.4	Concentration of molybdenum in water, in parts per billion
>	MO_PPM	Sediment	Real	12.4	Concentration of molybdenum in sediments, in parts per million
>	NA_PPM	Water	Real	12.4	Concentration of sodium in water, in parts per million
>	NA_PCT	Sediment	Real	8.4	Concentration of sodium in sediments, in percent
>	NB_PPB	Water	Real	12.4	Concentration of niobium in water, in parts per billion
>	NB_PPM	Sediment	Real	12.4	Concentration of niobium in sediments, in parts per million
>	NI_PPB	Water	Real	12.4	Concentration of nickel in water, in parts per billion
>	NI_PPM	Sediment	Real	12.4	Concentration of nickel in sediments, in parts per million
>	P_PPB	Water	Real	12.4	Concentration of phosphorus in water, in parts per billion
>	P_PPM	Sediment	Real	12.4	Concentration of phosphorus in sediments, in parts per million
>	PB_PPB	Water	Real	12.4	Concentration of lead in water, in parts per billion
>	PB_PPM	Sediment	Real	12.4	Concentration of lead in sediments, in parts per million
>	PT_PPM	Sediment	Real	12.4	Concentration of platinum in sediments, in parts per million
>	RB_PPM	Sediment	Real	12.4	Concentration of rubidium in sediments, in parts per million
>	SB_PPM	Sediment	Real	12.4	Concentration of antimony in sediments, in parts per million
>	SC_PPB	Water	Real	12.4	Concentration of scandium in water, in parts per billion
>	SC_PPM	Sediment	Real	12.4	Concentration of scandium in sediments, in parts per million
>	SE_PPB	Water	Real	12.4	Concentration of selenium in water, in parts per billion
>	SE_PPM	Sediment	Real	12.4	Concentration of selenium in sediments, in parts per million
>	SI_PPM	Water	Real	12.4	Concentration of silicon in water, in parts per million
>	SM_PPM	Sediment	Real	12.4	Concentration of samarium in sediments, in parts per million
>	SN_PPM	Sediment	Real	12.4	Concentration of tin in sediments, in parts per million
>	SR_PPB	Water	Real	12.4	Concentration of strontium in water, in parts per billion
>	SR_PPM	Sediment	Real	12.4	Concentration of strontium in sediments, in parts per million
>	TA_PPM	Sediment	Real	12.4	Concentration of tantalum in sediments, in parts per million
>	TB_PPM	Sediment	Real	12.4	Concentration of terbium in sediments, in parts per million
>	TH_PPB	Water	Real	12.4	Concentration of thorium in water, in parts per billion
>	TH_PPM	Sediment	Real	12.4	Concentration of thorium in sediments, in parts per million
>	TI_PPB	Water	Real	12.4	Concentration of titanium in water, in parts per billion
>	TI_PPM	Sediment	Real	12.4	Concentration of titanium in sediments, in parts per million
>	U_DN_PPB	Water	Real	12.4	Concentration of uranium in water, in parts per billion, determined by delayed neutron counting
>	U_DN_PPM	Sediment	Real	12.4	Concentration of uranium in sediments, in parts per million, determined by delayed neutron counting
>	U_FL_PPB	Water	Real	12.4	Concentration of uranium in water, in parts per billion, determined by fluorescence spectroscopy
>	U_FL_PPM	Sediment	Real	12.4	Concentration of uranium in sediments, in parts per million, determined by fluorescence spectroscopy
>	U_MS_PPB	Water	Real	12.4	Concentration of uranium in water, in parts per billion, determined by mass spectrometry
>	U_MS_PPM	Sediment	Real	12.4	Concentration of uranium in sediments, in parts per million, determined by mass spectrometry
>	U_NA_PPM	Sediment	Real	12.4	Concentration of uranium in sediments, in parts per million, determined by neutron activation
>	U_XX_PPB	Water	Real	12.4	Concentration of uranium in water, in parts per billion, determined by an extra or multiple uranium analysis
>	U_XX_PPM	Sediment	Real	12.4	Concentration of uranium in sediments, in parts per million, determined by an extra or multiple uranium analysis
>	U_XX_MTHD	Both	Text	8	Analytical method code for extra or multiple uranium analyses (U_XX_PPM or U_XX_PPB)
>	V_PPB	Water	Real	12.4	Concentration of vanadium in water, in parts per billion
>	V_PPM	Sediment	Real	12.4	Concentration of vanadium in sediments, in parts per million
>	W_PPM	Sediment	Real	12.4	Concentration of tungsten in sediments, in parts per million
>	Y_PPB	Water	Real	12.4	Concentration of yttrium in water, in parts per billion
>	Y_PPM	Sediment	Real	12.4	Concentration of yttrium in sediments, in parts per million
>	YB_PPM	Sediment	Real	12.4	Concentration of ytterbium in sediments, in parts per million
>	ZN_PPB	Water	Real	12.4	Concentration of zinc in water, in parts per billion
>	ZN_PPM	Sediment	Real	12.4	Concentration of zinc in sediments, in parts per million
>	ZR_PPB	Water	Real	12.4	Concentration of zirconium in water, in parts per billion
>	ZR_PPM	Sediment	Real	12.4	Concentration of zirconium in sediments, in parts per million
>	METH_PPM	Water	Real	12.4	Concentration of methane in water, in parts per million
>	ETH_PPM	Water	Real	12.4	Concentration of ethane in water, in parts per million
>	PROP_PPM	Water	Real	12.4	Concentration of propane in water, in parts per million
>	BUT_PPM	Water	Real	12.4	Concentration of butane in water, in parts per million
>	RN_PCI-L	Water	Real	12.4	Concentration of radon in water, in picocuries per liter (pCi/l)
>	NO3_PPM	Water	Real	12.4	Concentration of nitrate in waters, in parts per million
>	PO4_PPM	Both	Real	12.4	Concentration of phosphate in water or sediments, in parts per million
>	SO4_PPM	Both	Real	12.4	Concentration of sulfate in water or sediments, in parts per million
>	HENRATIO	Water	Real	12.4	The measured ratio of helium/neon in water
>	METHODS	Both	Text	40	Analytical method codes for each method used to determine the element concentrations listed in the record

Entity and attribute detail citation:
http://tin.er.usgs.gov/nure/sediment/NURE_Manual.shtml

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Distribution Information:

Distributor:

Contact information:

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Country: United States of America

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Resource description: Downloadable Data

Distribution liability:
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Standard order process:
Digital form:
Digital transfer information:
Format name: Shapefile
Format version number: 1.0
Format information content:
Sediment sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
Transfer size: 30 megabytes
*__Dataset size:__ 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/sediment/nuresed.zip

Standard order process:
Digital form:
Digital transfer information:
Format name: Shapefile
Format version number: 1.0
Format information content:
Water sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
Transfer size: 16.4 megabytes
*__Dataset size:__ 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/water/nurewtr.zip

Standard order process:
Digital form:
Digital transfer information:
Format name: Shapefile
Format version number: 1.0
Format information content:
Sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
*__Dataset size:__ 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/sediment/select.php
Network resource name: http://tin.er.usgs.gov/nure/water/select.php

Digital form:
Digital transfer information:
Format name: DBF
Format version number: dBase III
Format information content:
Sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
*__Dataset size:__ 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/sediment/select.php
Network resource name: http://tin.er.usgs.gov/nure/water/select.php

Digital form:
Digital transfer information:
Format name: HTML
Format version number: 2.0
Format information content:
Sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
*__Dataset size:__ 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/sediment/select.php
Network resource name: http://tin.er.usgs.gov/nure/water/select.php

Digital form:
Digital transfer information:
Format name: Text
Format specification:
Tab-delimited or comma-delimited, at user's option
Format information content:
Sample information and geochemical measurements, geographic areas of coverage specified by the user.
File decompression technique: unzip
***Dataset size:** 0.301

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://tin.er.usgs.gov/nure/sediment/select.php
Network resource name: http://tin.er.usgs.gov/nure/water/select.php

Fees: none

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Metadata Reference Information:

***Metadata date:** 20070801

***Language of metadata:** en

Metadata contact:
Contact information:
Contact person primary:
Contact person: Smith, Steven M.
Contact organization: U.S. Geological Survey
Contact position: Geologist

Contact address:
Address type: Mailing address
Address:
Box 25046, Mailstop 973, Denver Federal Center
City: Denver
State or province: Colorado
Postal code: 80225-0046
Country: United States of America

Contact voice telephone: 1-303-236-1192
Contact facsimile telephone: 1-303-236-3200

Contact electronic mail address: smsmith@usgs.gov

***Metadata standard name:** FGDC Content Standards for Digital Geospatial Metadata
***Metadata standard version:** FGDC-STD-001-1998
***Metadata time convention:** local time

Metadata extensions:
***Online linkage:** http://www.esri.com/metadata/esriprof80.html
***Profile name:** ESRI Metadata Profile

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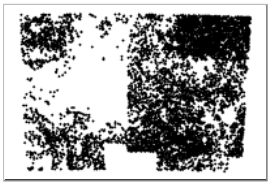
Binary Enclosures:

Thumbnail:
Enclosure type: Picture



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