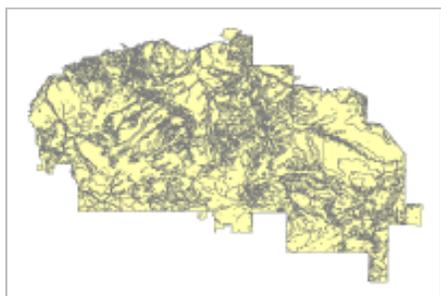


Aquifer Sensitivity Assessment of the Navajo Nation



Data format: Shapefile

File or table name: NN_Aquifer_Sensitivity

Coordinate system: Geographic

Theme keywords: Aquifer Sensitivity, Potential for Contamination

Abstract: This ESRI Arc/Info polygon coverage assesses aquifer sensitivity on the Navajo Nation, as determined by Blanchard (2002) in US Geological Survey Water-Resources Investigations Report 02-4051. In this report Blanchard cites EPA's definition of aquifer sensitivity as the "relative ease with which a contaminant applied on or near a land surface can migrate to the aquifer of interest. Aquifer sensitivity is a function of the intrinsic characteristics of the geological materials, and the overlying unsaturated zone." Although the assessment by Blanchard relates to pesticide contamination, the model developed uses broad physical characteristics to describe the aspects of aquifer sensitivity that do not specifically relate to pesticide contamination. The factors used in the Blanchard model include geology, precipitation, soil properties, slope of the land surface and stream courses. Blanchard stated that the largest limitation on this method was inadequate information on depth to the uppermost aquifer. The results of the study classify aquifer sensitivity into most, intermediate, least, and insignificant potential for contamination of ground water.

FGDC and ESRI Metadata:

- [Identification Information](#)
- [Data Quality Information](#)
- [Spatial Data Organization Information](#)
- [Spatial Reference Information](#)
- [Entity and Attribute Information](#)
- [Distribution Information](#)
- [Metadata Reference Information](#)
- [Binary Enclosures](#)

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: Paul J. Blanchard, U.S. Geological Survey

Title:

Aquifer Sensitivity Assessment of the Navajo Nation

***File or table name:** NN_Aquifer_Sensitivity

Publication date: 2002

***Geospatial data presentation form:** vector digital data

Series information:

Series name: Water Resources Investigations Report

Issue identification: 02-4051

Publication information:

Publication place: Albuquerque, New Mexico

Publisher: U.S. Geological Survey

Other citation details:

Blanchard, Paul J., 2002. "Assessments of Aquifer Sensitivity on Navajo Nation and Adjacent Lands and Ground-water Vulnerability to Pesticide Contamination on the Navajo Indian Irrigation Project, Arizona, New Mexico, and Utah." U.S. Geological Survey Water Resources Investigations Report 02-4051, 27 p. (Skey=S01200301)

***Online linkage:**

\\Terra_dc\Navajo\NAUM_NN_Summary\DB\Water\NN_Aquifer_Sensitivity.shp

Description:

Abstract:

This ESRI Arc/Info polygon coverage assesses aquifer sensitivity on the Navajo Nation, as determined by Blanchard (2002) in US Geological Survey Water-Resources Investigations Report 02-4051. In this report Blanchard cites EPA's definition of aquifer sensitivity as the "relative ease with which a contaminant applied on or near a land surface can migrate to the aquifer of interest. Aquifer sensitivity is a function of the intrinsic characteristics of the geological materials, and the overlying unsaturated zone." Although the assessment by Blanchard relates to pesticide contamination, the model developed uses broad physical characteristics to describe the aspects of aquifer sensitivity that do not specifically relate to pesticide contamination. The factors used in the Blanchard model include geology, precipitation, soil properties, slope of the land surface and stream courses. Blanchard stated that the largest limitation on this method was inadequate information on depth to the uppermost aquifer. The results of the study classify aquifer sensitivity into most, intermediate, least, and insignificant potential for contamination of ground water.

Purpose:

Blanchard performed this assessment to assist the Navajo Nation Environmental Protection Agency in developing a Pesticide Management Plan as required by the US Environmental Protection Agency. This dataset is the aquifer sensitivity assessment part of the study. An assessment of ground-water vulnerability to pesticide contamination at the Navajo Indian Irrigation Project was also performed and is not presented here.

Supplemental information:

This dataset can be used to assist in the assessment of aquifer sensitivity to contamination by uranium and its daughter products. The parameters used to make this assessment, precipitation, slope of land surface, depth to ground water, physical and hydrologic characteristics of soils and overlying geology, are pertinent to potential contamination by uranium and its daughter products.

***Language of dataset:** en

Time period of content:**Time period information:****Single date/time:****Calendar date:** 2002**Currentness reference:**

publication date

Status:**Progress:** Complete**Maintenance and update frequency:** None planned**Spatial domain:****Bounding coordinates:*****West bounding coordinate:** -111.863467***East bounding coordinate:** -106.920293***North bounding coordinate:** 37.462056***South bounding coordinate:** 34.278071**Local bounding coordinates:*****Left bounding coordinate:** -111.863467***Right bounding coordinate:** -106.920293***Top bounding coordinate:** 37.462056***Bottom bounding coordinate:** 34.278071**Keywords:****Theme:****Theme keywords:** Aquifer Sensitivity, Potential for Contamination**Theme keyword thesaurus:** None**Place:****Place keywords:** Navajo Nation, Arizona, New Mexico, Utah, USA, United States**Place keyword thesaurus:** None**Stratum:****Stratum keywords:** Ground Surface**Access constraints:** None**Use constraints:**

This data set covers the study area of the Navajo Nation and some other adjacent and mixed ownership lands in northwestern New Mexico. Aquifer sensitivity in this study was performed with concern for potential pesticide contamination.

Use of this data generally requires computer workstations with ESRI's Arc/Info (7.x or above), ArcGIS (8.x or above), or ArcView (3.x or 8.x), or some other GIS or CAD software that is capable of reading or converting this dataset.

The data are provided "as-is," without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

These data have been compiled as part of a desktop project to collect existing spatial data to support the study of Navajo abandoned uranium mines. No field verifications were undertaken as part of this desktop study.

Point of contact:**Contact information:****Contact organization primary:**

Contact organization: U. S. Environmental Protection Agency, Region 9,
Superfund Program

Contact address:

Address type: mailing and physical address

Address:

75 Hawthorne St (SFD 8-2)

City: San Francisco

State or province: CA

Postal code: 94105

Country: USA

Contact voice telephone: 415-972-3167

Data set credit:

Paul Blanchard of the U.S Geological Survey performed the study that developed this assessment. USGS notes that this study was performed in cooperation with the Navajo Nation Environmental Protection Agency Pesticides Program.

Security information:

Security classification system: None

Security classification: Unclassified

***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:**

Not available from originator.

Logical consistency report:

Polygon topology is clean and present.

Completeness report:

Not available from originator.

Positional accuracy:**Horizontal positional accuracy:****Horizontal positional accuracy report:**

Not available from originator.

Lineage:**Source information:****Source citation:****Citation information:**

Originators: U.S. Geological Survey Professional Paper 521-A

Title:

Regional Hydrogeology of the Navajo and Hopi Indian Reservations,
Arizona, New Mexico, and Utah

Publication date: 1968

Geospatial data presentation form: map

Series information:

Series name: U.S. Geological Survey Professional Paper

Issue identification: 521-A

Publication information:

Publication place: Unknown

Publisher: U.S. Geological Survey

Other citation details:

Cooley, M. E., J. W. Harshbarger, J.P. Akers, and W.F. Hardt with a section on vegetation by O.N. Hicks, 1969. "Regional Hydrogeology of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah." U.S. Geological Survey Professional Paper 521-A, prepared in cooperation with the Bureau of Indian Affairs and the Navajo Nation, 61 p. (S10290201)

Source scale denominator: 1:100,000

Type of source media: map

Source citation abbreviation:

Geology

Source contribution:

Identifies areas where consolidated rocks are recharged and where unconsolidated deposits (alluvium, and eolian terrace, and landslide deposits) are at the surface. Geology served as a surrogate for impact of the vadose zone. This series of map plates does not include the southeastern most part of the USGS study area. It does cover all of the contiguous Navajo Nation.

Source time period of content:

Time period information:

Single date/time:

Calendar date: 1969

Source currentness reference:

publication date

Source information:

Source citation:

Citation information:

Originators: Daly, Christopher and Taylor, George, Spatail Climate Analysis Service at Oregon State University

Title:

United States Average Monthly or Annual Precipitation, 1961-1990

Publication date: 1998

Geospatial data presentation form: vector digital data

Publication information:

Publication place: Corvallis, OR
Publisher: Spatial Climate Analysis Service

Other citation details:

Accessed December 3, 1998, at URL
http://www.ocs.orst.edu/prism/prism_new.html

Online linkage: http://www.ocs.orst.edu/prism/prism_new.html

Source scale denominator: Unknown

Type of source media: digital data

Source citation abbreviation:

Precipitation

Source contribution:

Annual precipitation was used as a surrogate for recharge. Actual recharge is a small percentage of precipitation. 10% was used as the maximum percentage of precipitation that becomes recharge. The precipitation source is PRISM (Parameter-elevation Regressions on Independent Slopes Model).

Source time period of content:

Time period information:

Range of dates/times:

Beginning date: 1961

Beginning time: unknown

Ending date: 1990

Ending time: unknown

Source currentness reference:

ground condition

Source information:

Source citation:

Citation information:

Originators: Schwarz, G E and Alexander, R B

Title:

State soil geographic (STATSGO) database for the conterminous United States

Publication date: 1995

Geospatial data presentation form: vector digital data

Series information:

Series name: US Geological Survey Open-File Report

Issue identification: 95-449

Publication information:

Publication place: Unknown

Publisher: US Geological Survey

Other citation details:

Accessed on December 18, 1999 at URL
<http://water.usgs.gov/lookup/getspatial/ussoils/ussoils.html>

Online linkage:

<http://water.usgs.gov/lookup/getspatial/ussoils/ussoils.html>

Source scale denominator: 1:250,000
Type of source media: Arc/Info Coverage
Source citation abbreviation:
 Soil Properties

Source contribution:
 The STATSGO (STATE Soil GeOgraphic) database, originated by the US Department of Agriculture, Natural Resources Conservation Service, was modified by Schwarz and Alexander (1995) of USGS. Soil texture, infiltration rate, drainage, and organic content were aggregated to develop a classification of hydrologic groups. These groups were assigned to classes of potential to facilitate contamination of ground water. The classes range from most to intermediate to least.

Source time period of content:
Time period information:
Single date/time:
Calendar date: 1995

Source currentness reference:
 publication date

Source information:

Source citation:
Citation information:
Originators: US Geological Survey

Title:
 Digital Elevation Models

Publication date: Unknown
Geospatial data presentation form: raster digital data

Publication information:
Publication place: Unknown
Publisher: US Geological Survey

Source scale denominator: 1:250,000
Type of source media: digital data
Source citation abbreviation:
 Slope & Stream Courses

Source contribution:
 USGS Digital Elevation Models (DEMs) were used to determine slope of the land surface. Slope was classified in terms of potential to facilitate contamination of ground water, where steep slopes minimize the potential and shallow slopes maximize the potential.

DEMs were also used to develop Strahler fourth-order and higher stream courses, using ESRI Arc/Info GRID. These were buffered and assigned the highest potential to facilitate contamination of the ground water due to the shallow ground water moving and being stored in floodplain and terrace deposits along these stream courses.

Source time period of content:
Time period information:
Single date/time:

Calendar date: unknown

Source currentness reference:
ground condition

Process step:

Process description:

The following publication provides the description of the methodology used to develop the assessment of aquifer sensitivity on the Navajo Nation: Blanchard, Paul J., 2002. "Assessments of Aquifer Sensitivity on Navajo Nation and Adjacent Lands and Ground-water Vulnerability to Pesticide Contamination on the Navajo Indian Irrigation Project, Arizona, New Mexico, and Utah." U.S. Geological Survey Water Resources Investigations Report 02-4051, 27 p. (Skey=S01200301)

Process software and version: ESRI Arc/Info

Process date: Unknown

Source used citation abbreviation:

Geology

Source used citation abbreviation:

Precipitation

Source used citation abbreviation:

Soil Properties

Source used citation abbreviation:

Slope & Stream Courses

Process contact:

Contact information:

Contact organization primary:

Contact person: Paul J Blanchard

Contact organization: US Geological Survey

Contact position: Hydrologist (Geol.)

Contact address:

Address type: mailing and physical address

Address:

pblanch@usgs.gov

City: Albuquerque

State or province: NM

Postal code: 87109-1311

Country: USA

Contact voice telephone: (505) 830-7947

Process step:

Process description:

Projected to Geographic, Decimal Degrees, NAD83

Process software and version: ESRI ArcGIS 8.2

Process date: 2003

Process contact:

Contact information:

Contact organization primary:

Contact organization: TerraSpectra Goematics

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[Back to Top](#)

Spatial Data Organization Information:***Direct spatial reference method:** Vector**Point and vector object information:****SDTS terms description:*****Name:** NN_Aquifer_Sensitivity***SDTS point and vector object type:** G-polygon***Point and vector object count:** 9719**SDTS terms description:*****Name:** label***SDTS point and vector object type:** Label point***Point and vector object count:** 9719**SDTS terms description:*****Name:** polygon***SDTS point and vector object type:** GT-polygon composed of chains***Point and vector object count:** 9719**SDTS terms description:*****Name:** tic***SDTS point and vector object type:** Point***Point and vector object count:** 4**ESRI terms description:*****Name:** NN_Aquifer_Sensitivity***ESRI feature type:** Simple***ESRI feature geometry:** Polygon***ESRI topology:** FALSE***ESRI feature count:** 9719***Spatial index:** FALSE***Linear referencing:** FALSE**ESRI terms description:*****Name:** label***ESRI feature type:** Simple***ESRI feature geometry:** Label***ESRI topology:** FALSE***ESRI feature count:** 9719***Spatial index:** FALSE

***Linear referencing:** FALSE

ESRI terms description:

***Name:** polygon
 ***ESRI feature type:** Simple
 ***ESRI feature geometry:** Polygon
 ***ESRI topology:** TRUE
 ***ESRI feature count:** 9719
 ***Spatial index:** FALSE
 ***Linear referencing:** FALSE

ESRI terms description:

***Name:** tic
 ***ESRI feature type:** Simple
 ***ESRI feature geometry:** Tic
 ***ESRI topology:** FALSE
 ***ESRI feature count:** 4
 ***Spatial index:** FALSE
 ***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: 0.000001
Longitude resolution: 0.000001
 ***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_Aquifer_Sensitivity

Entity type:

***Entity type label:** NN_Aquifer_Sensitivity
 ***Entity type type:** Feature Class
 ***Entity type count:** 9719

Entity type definition:

Assessment of Aquifer Sensitivity on the Navajo Nation

Entity type definition source:

US Geological Survey

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:** SENS_CLASS
- ***Attribute alias:** SENS_CLASS
- ***Attribute type:** Number
- ***Attribute width:** 6

Overview description:**Dataset overview:**

There are 9719 polygons presenting classes of potential contamination of ground water.

Entity and attribute overview:

SENS-CLASS is the one polygon thematic attribute. It provides the classification of potential contamination of ground water. There are no thematic arc attributes.

Entity and attribute detail citation:

Blanchard, Paul J., 2002. "Assessments of Aquifer Sensitivity on Navajo Nation and Adjacent Lands and Ground-water Vulnerability to Pesticide Contamination on the Navajo Indian Irrigation Project, Arizona, New Mexico, and Utah." U.S. Geological Survey Water Resources Investigations Report 02-4051, 27 p. (Skey=S01200301)

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Distribution Information:

Distributor:

Contact information:

Contact organization primary:

Contact organization: U. S. Environmental Protection Agency, Region 9,
Superfund Records Center

Contact address:

Address type: mailing address

Address:

95 Hawthorne St (SFD-7C)

City: San Francisco

State or province: CA

Postal code: 94105

Country: USA

Contact voice telephone: 415-536-2033

Distribution liability:

Although these data have been processed successfully on a computer system for the US EPA, no warranty expressed or implied is made by the US EPA or its contractors regarding the utility of the data on any other system, nor shall the act of distribution constitute any such warranty. No responsibility is assumed by US EPA or its contractors in the use of these data.

Standard order process:

Digital form:

Digital transfer information:

***Transfer size:** 18.226

***Dataset size:** 18.226

Custom order process:

Contact the US EPA for a custom order.

Technical prerequisites:

Use of this data generally requires computer workstations with ESRI's Arc/Info (7.x or above), ArcGIS (8.x or above), or ArcView (3.x or 8.x), or some other GIS or CAD software that is capable of reading or converting this dataset.

Available time period:

Time period information:

Single date/time:

Calendar date: unknown

Time of day: unknown

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Metadata Reference Information:

***Metadata date:** 20070803

***Language of metadata:** en

Metadata contact:

Contact information:

Contact organization primary:

Contact person: REQUIRED: The person responsible for the metadata information.

Contact organization: U. S. Environmental Protection Agency, Region 9, Superfund Program

Contact address:

Address type: mailing and physical address

Address:

75 Hawthorne St (SFD 8-2)

City: San Francisco

State or province: CA

Postal code: 94105

Country: USA

Contact voice telephone: 415-972-3167

***Metadata standard name:** FGDC Content Standards for Digital Geospatial Metadata

***Metadata standard version:** FGDC-STD-001-1998

***Metadata time convention:** local time

Metadata access constraints: None.

Metadata use constraints:

None.

Metadata security information:

Metadata security classification system: None

Metadata security classification: Unclassified

Metadata extensions:

***Online linkage:** <http://www.esri.com/metadata/esriprof80.html>

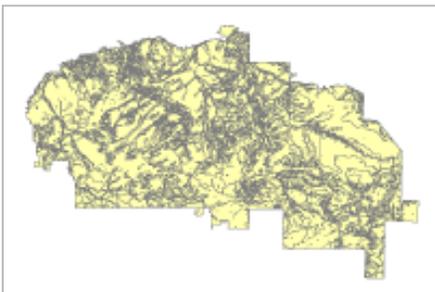
***Profile name:** ESRI Metadata Profile

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Binary Enclosures:

Thumbnail:

Enclosure type: Picture



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