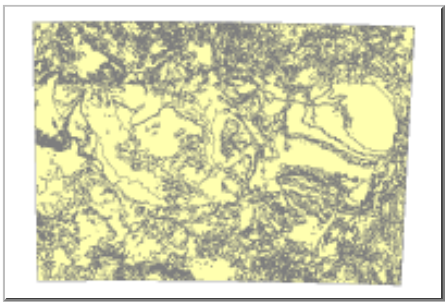
Navajo Nation Geology



Data format: Shapefile

File or table name: NN_Geology

Coordinate system: Geographic

Theme keywords: geology, substrate

Abstract: This data set is a seamless 1:500,000 scale surficial geologic coverage for the states of Arizona, Colorado, Nevada, New Mexico and Utah. The coverage was compiled and edge matched from existing digital versions of the 1:500,000 scale state geologic maps (Green, 1992; Ramsey, 1996; Turner and Bawiec, 1996; Green and Jones, 1997; Hirschberg and Pitts, 2000). Similar geologic units were correlated only along state boundaries to facilitate edge matching. Correlation and merging of units along state boundaries was based on similar age and characteristics of units. Landsat TM images were geologically interpreted to facilitate accurate mapping and edge matching along state boundaries. Whenever possible existing state specific geologic detail was maintained. Soil substrate classification was derived from a 1:500,000 scale geologic coverage using a modified soil classification scheme developed by NatureServe. Soil substrate codes and geology were correlated based of bulk rock chemical compositions and characteristics. Soil substrate codes are as follows: QYA = Quaternary age younger alluvium and surficial deposits, QOA = Quaternary age older alluvium and surficial deposits, EOS = Unconsolidated Aeolian sand deposits both active and stabilized, SND = Sandstone dominated formations of all ages, SLM = Siltstone and/or mudstone dominated formations of all ages, SHL = Shale dominated formations of all ages, CLM = Carbonate dominated formations either limestone or dolomites of all ages, EVP = Evaporite units either halite, gypsum, or other saline mineral dominated formations of all ages, GSL = Metamorphic or igneous units with a dominantly silicic composition all ages, BMC = Metamorphic or igneous units with dominantly mafic composition all ages, H20 = Water, and UNK= unable to assign a substrate type. This polygon shapefile was clipped to the area of the Navajo Nation and attributes for Age, Rock Type, and concatenated Age and Rock Type, along with a numeric code for SUBS_CODE.

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: RS/GIS Laboratory, College of Natural Resources, Utah State University

Title:

Navajo Nation Geology

***File or table name:** NN_Geology

Publication date: 20040917
Edition: version 1.0
***Geospatial data presentation form:** vector digital data

Online linkage: http://earth.gis.usu.edu/swgap/

Larger work citation:

Citation information:

Originators: USGS GAP Analysis Program

Title:

Tentative title "Southwest Regional GAP Analysis Project Final Report."

Publication date: Unpublished Material

Description:

Abstract:

This data set is a seamless 1:500,000 scale surficial geologic coverage for the states of Arizona, Colorado, Nevada, New Mexico and Utah. The coverage was compiled and edge matched from existing digital versions of the 1:500,000 scale state geologic maps (Green, 1992; Ramsey, 1996; Turner and Bawiec, 1996; Green and Jones, 1997; Hirschberg and Pitts, 2000). Similar geologic units were correlated only along state boundaries to facilitate edge matching. Correlation and merging of units along state boundaries was based on similar age and characteristics of units. Landsat TM images were geologically interpreted to facilitate accurate mapping and edge matching along state boundaries. Whenever possible existing state specific geologic detail was maintained. Soil substrate classification was derived from a 1:500,000 scale geologic coverage using a modified soil classification scheme developed by NatureServe.

Soil substrate codes and geology were correlated based of bulk rock chemical compositions and characteristics. Soil substrate codes are as follows: QYA = Quaternary age younger alluvium and surficial deposits, QOA = Quaternary age older alluvium and surficial deposits, EOS = Unconsolidated Aeolian sand deposits both active and stabilized, SND = Sandstone dominated formations of all ages, SLM = Siltstone and/or mudstone dominated formations of all ages, SHL = Shale dominated formations of all ages, CLM = Carbonate dominated formations either limestone or dolomites of all ages, EVP = Evaporite units either halite, gypsum, or other saline mineral dominated formations of all ages, GSL = Metamorphic or igneous units with a dominantly silicic composition all ages, BMC = Metamorphic or igneous units with dominantly mafic composition all ages, H20 = Water, and UNK= unable to assign a substrate type.

This polygon shapefile was clipped to the area of the Navajo Nation and attributes for Age, Rock Type, and concatenated Age and Rock Type, along with a numeric code for SUBS_CODE.

Purpose:
The geology GIS dataset may be used for various purposes with user's discretion. Formal validation of this dataset has not been conducted.

***Language of dataset:** en

Time period of content:
Time period information:
Range of dates/times:
Beginning date: 1992
Ending date: 1997

Currentness reference:
publication date

Status:
Progress: Complete
Maintenance and update frequency: None planned

Spatial domain:
Bounding coordinates:
***West bounding coordinate:** -112.365634
***East bounding coordinate:** -106.612565
***North bounding coordinate:** 37.947566
***South bounding coordinate:** 33.981695

Local bounding coordinates:
***Left bounding coordinate:** -112.365634
***Right bounding coordinate:** -106.612565
***Top bounding coordinate:** 37.947566
***Bottom bounding coordinate:** 33.981695

Keywords:
Theme:
Theme keywords: geology, substrate
Theme keyword thesaurus: none

Place:
Place keywords: Navajo Nation, Arizona, Colorado, New Mexico, Utah, United States
Place keyword thesaurus: none

Access constraints: none
Use constraints:
none

Point of contact:
Contact information:
Contact organization primary:
Contact person: John Lowry
Contact organization: Remote Sensing/GIS Laboratory, College of Natural Resources, Utah State University

Contact address:
Address type: mailing
Address:
UMC 5275

City: Logan
State or province: Utah
Postal code: 84322-5275
Country: USA

Contact voice telephone: 435-797-0653

Data set credit:
Stefan Kirby, M.S. Candidate, Utah State University, Dept. of Geology, and Keith Pohs, USGS Southwest Biological Science Center, Colorado Plateau Field Station, Northern Arizona University

***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:
A formal assessment of the accuracy of this combined southwest geology dataset has not been conducted. Accuracy is assumed to be approximately the same as the 5 source datasets. See citations of original sources under Source Information, Source Citation of this metadata file.

All polygons should have a label for geologic formation (GEO_CODE). Where geologic formation codes differed across state boundaries, the originators' merging these datasets together had to decide which geologic formation code to keep. Thus, polygons that straddle state boundaries were labeled subject the originators' best professional judgement, available information associated with the source maps, and the interpretation of geologic formations from exiting Landsat TM imagery. Substrate codes were assigned to each geologic code with a look-up table appropriate for each state's geologic formation codes.

Logical consistency report:
The logical consistency of the input data layers from which this coverage was created was thoroughly reviewed, particularly at the juxtaposition of state boundaries where each state's geologic formation codes were cross-referenced and labeled according to the originators' best judgement. All polygons should be labeled with geologic formation and substrate codes. Some polygons were given an unknown substrate code (UNK) where there was not enough information available to assign a substrate type to a given geologic formation.

Completeness report:
All polygons should be labeled with a geologic formation code and a substrate code. Some polygons were given a unknown substrate code (UNK) indicating that the compilers did not feel they had enough information to assign a substrate type to a given geologic formation.

Lineage:
Source information:
Source citation:
Citation information:
Originators: Green, G. N.

Title:
The Digital Geologic Map of Colorado in ArcInfo Format.

Publication date: 1992
Geospatial data presentation form: vector digital data

Source scale denominator: 500,000
Type of source media: online
Source citation abbreviation:
OF-92-0507, US Geological Survey, Denver, Colorado
Source contribution:
Digital dataset for Colorado geology at 1:500k

Source time period of content:
Time period information:
Single date/time:
Calendar date: 1992

Source currentness reference:
publication date

Source information:
Source citation:
Citation information:
Originators: Green, G. N. and G.E. Jones

Title:
The Digital Geologic Map of New Mexico 1:500,000 scale in ArcInfo Format

Publication date: 1997
Geospatial data presentation form: vector digital data

Source scale denominator: 500,000
Type of source media: online
Source citation abbreviation:
OF-97-0052, US Geological Survey, Denver, Colorado
Source contribution:
Digital dataset for New Mexico geology at 1:500k

Source time period of content:
Time period information:
Single date/time:
Calendar date: 1997

Source currentness reference:
publication date

Source information:
Source citation:
Citation information:
Originators: Hirschberg, D.M. and S.G. Pitts

Title:
Digital Geologic Map of Arizona: A Digital Database from the 1983

Printing of Wilson, Moore and Cooper, 1:500,000 scale map of Arizona.

Publication date: 2000
Geospatial data presentation form: vector digital data

Source scale denominator: 500,000
Type of source media: online
Source citation abbreviation:
OF-00-409, US Geological Survey, Denver, Colorado
Source contribution:
Digital dataset for Arizona geology at 1:500k

Source time period of content:
Time period information:
Single date/time:
Calendar date: 2000

Source currentness reference:
publication date

Source information:
Source citation:
Citation information:
Originators: Ramsey, R.D.

Title:
Digital Compilation of Geologic Map of Utah by L.F. Hintze, G.C. Willis, D.Y.M. Laes, D.A. Sprinkle and K.D. Brown.

Publication date: 1996
Geospatial data presentation form: vector digital data

Source scale denominator: 500,000
Type of source media: online
Source citation abbreviation:
DDS 41, US Geologcial Survey, Denver, Colorado
Source contribution:
Digital dataset for Colorado geology at 1:500k

Source time period of content:
Time period information:
Range of dates/times:
Beginning date: 1992
Ending date: 1997

Source currentness reference:
publication date

Source information:
Source citation:
Citation information:
Originators: Truner, R.M. and W.J. Bawic

Title:
Digital Map of Nevada at scale of 1:500,000

Publication date: 1996
Geospatial data presentation form: vector digital data

Source scale denominator: 500,000
Type of source media: online
Source citation abbreviation:
DDS 41, US Geological Survey, Denver, Colorado
Source contribution:
Digital dataset for Nevada geology at 1:500k

Source time period of content:
Time period information:
Single date/time:
Calendar date: 19996

Source currentness reference:
publication date

Process step:
Process description:
1) All 5 digital datasets were converted to ArcInfo coverages and attribute fields for geologic formation code were standardized.
2) All 5 digital datasets were APPENDed together in ArcInfo.
3) Using paper copy geologic maps in hand, and Landsat TM imagery as a backdrop, polygons straddling state boundaries were MERGED. When necessary polygon lines were re-shaped to make boundary polygons match.
4) When geologic codes differed across state boundaries, the originator (compiler) used best professional judgement and information associated with paper maps to dectermine appropriate geologic code.
5) Substrate codes were assigned to geologic codes using best professional judgement with a look-up table.
6) Dataset was quality controlled for unlabeled polygons and other possible errors.

Process date: 20030901

Process step:
Process description:
Dataset was projected and clipped to the are of the Navajo Nation.

Fours Attibutes were added:

SUBS_NUM provides a numeric coding for SUBS_CODE

QYA = 8
QOA = 7
EOS = 3
SND = 11
SLM = 10
SHL = 9
CLM = 2
EVP = 4
GSL = 5
BMC = 1
H2O = 6
UNK = 12

AGE - map units were generalized using the following age codes present in the region:

J - Jurassic
T - Tertiary
JTR - Jurassic/Triassic
TR - Triassic
K - Cretaceous
PC - Precambrian
Q - Quaternary
P - Paleozoic
TK - Tertiary/Cretaceous
QT - Quaternary/Tertiary
W - Water

ROCKTYPE - generalized rock type

S - Sedimentary
I - Intrusive
M - Metamorphic
V - Volcanic
W - Water

AGE_TYPE - a Concatenation of AGE (Uppercase) and ROCKTYPE (Lowercase)

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

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_Geology
*SDTS point and vector object type: G-polygon
*Point and vector object count: 6664

ESRI terms description:
*Name: NN_Geology
*ESRI feature type: Simple
*ESRI feature geometry: Polygon
*ESRI topology: FALSE
*ESRI feature count: 6664
*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_Geology

Entity type:
*Entity type label: NN_Geology
*Entity type type: Feature Class
*Entity type count: 6664

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: AREA
*Attribute alias: AREA

*Attribute type: Number
*Attribute width: 15
*Attribute number of decimals: 3

Attribute:
*Attribute label: PERIMETER
*Attribute alias: PERIMETER

*Attribute type: Number
*Attribute width: 15
*Attribute number of decimals: 3

Attribute:
*Attribute label: SWGEOL_ID
*Attribute alias: SWGEOL_ID

*Attribute type: Number
*Attribute width: 9

Attribute:
*Attribute label: ST
*Attribute alias: ST

*Attribute type: String
*Attribute width: 3

Attribute:

*Attribute label: GEO_CODE
*Attribute alias: GEO_CODE

*Attribute type: String
*Attribute width: 10

Attribute:
*Attribute label: ST_CODE
*Attribute alias: ST_CODE

*Attribute type: String
*Attribute width: 15

Attribute:
*Attribute label: SUBS_CODE
*Attribute alias: SUBS_CODE

*Attribute type: String
*Attribute width: 254

Attribute:
*Attribute label: SUBS_NUM
*Attribute alias: SUBS_NUM

*Attribute type: Number
*Attribute width: 9

Attribute:
*Attribute label: AGE
*Attribute alias: AGE

*Attribute type: String
*Attribute width: 10

Attribute:
*Attribute label: ROCKTYPE
*Attribute alias: ROCKTYPE

*Attribute type: String
*Attribute width: 10

Attribute:
*Attribute label: AGE_TYPE
*Attribute alias: AGE_TYPE

*Attribute type: String
*Attribute width: 10

Overview description:

Dataset overview:

There are 6664 polygon map units

Entity and attribute overview:

The following is a list of the attributes used in this dataset:
ST = Original state dataset the polygon comes from.
GEO_CODE = Geologic formation code.

ST_CODE = Concatenation of ST and GEO_CODE.
SUBS_CODE = Substrate Code.
SUBSTRATE = Substrate description.

Description of Codes:
GEO_CODE is from the source geology map. See source information for appropriate state.
SUBS_CODE and SUBSTRATE were defined by NatureServe, and were assigned by the originator(s) of this dataset.

The following lists each SUBS_CODE and corresponding SUBSTRATE definitions identified in this dataset:
QYA = Quaternary age younger alluvium and surficial deposits.
QOA = Quaternary age older alluvium and surficial deposits.
EOS = Unconsolidated Aeolian sand deposits both active and stabilized.
SND = Sandstone dominated formations of all ages.
SLM = Siltstone and or mudstone dominated formations of all ages.
SHL = Shale dominated formations of all ages.
CLM = Carbonate dominated formations either limestone or dolomites of all ages.
EVP = Evaporite units either halite, gypsum, or other saline mineral dominated formation.
GSL = Metamorphic or igneous units with a dominantly silicic composition all ages.
BMC = Metamorphic or igneous units with dominantly mafic composition all ages.
H2O = Water.
UNK = Unable to determine substrate type.

Additional attributes added:

SUBS_NUM - Numeric version of SUBS_CODE

QYA = 8
QOA = 7
EOS = 3
SND = 11
SLM = 10
SHL = 9
CLM = 2
EVP = 4
GSL = 5
BMC = 1
H2O = 6
UNK = 12

AGE

J - Jurassic
T - Tertiary
JTR - Jurassic/Triassic
TR - Triassic
K - Cretaceous
PC - Precambrian
Q - Quaternary
P - Paleozoic
TK - Tertiary/Cretaceous
QT - Quaternary/Tertiary
W - Water

ROCKTYPE

S - Sedimentary
I - Intrusive
M - Metamorphic
V - Volcanic
W - Water

AGE_TYPE

Concatenation of AGE (Uppercase) and ROCKTYPE (Lowercase)

Entity and attribute detail citation:
For GEO_CODE see pertinent geologic map source information.
For SUBSTRATE, unpublished NatureServe document (2003).

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Distribution Information:

Distributor:
Contact information:
Contact person primary:
Contact person: John Lowry
Contact organization: RS/GIS Laboratory, Utah State University,

Contact address:
Address type: mailing address
Address:
UMC 5275, Utah State University
City: Logan
State or province: Utah
Postal code: 84322-5275
Country: U.S.A.

Contact voice telephone: 435-797-0653

Contact electronic mail address: jlowry@gis.usu.edu

Resource description: Southwest ReGAP geology dataset, clipped to the Navajo Nation Area

Distribution liability:
The RS/GIS Laboratory and Utah State University or their staff take no responsibility for the distribution, content, or use of these data.

Standard order process:
Digital form:
Digital transfer information:
Format name: ESRI ArcInfo coverage or ESRI ArcView Shapefile
Format version number: Unix ArcInfo Workstation 8.0.2. or ArcView 3.3
File decompression technique: Compression type *.zip or *.tgz. For windows use WinZip. For UNIX use tar -zxf <filename>.tgz

*Transfer size: 10.441
*Dataset size: 10.441

Digital transfer option:
Online option:
Computer contact information:
Network address:
Network resource name: http://earth.gis.usu.edu/swgap/

Fees: none

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Metadata Reference Information:

*Metadata date: 20070719
Metadata review date: 20040915

*Language of metadata: en

Metadata contact:
Contact information:
Contact person primary:
Contact person: John Lowry
Contact organization: RS/GIS Laboratory, Utah State University

Contact address:
Address type: mailing
Address:
UMC 5275, Utah State University
City: Logan
State or province: Utah
Postal code: 84322-5275
Country: U.S.A.

Contact voice telephone: 435-797-0653

Contact electronic mail address: jlowry@gis.usu.edu

*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 security handling description:
none

Metadata extensions:

*__Online linkage:__ http://www.esri.com/metadata/esriprof80.html
*__Profile name:__ ESRI Metadata Profile

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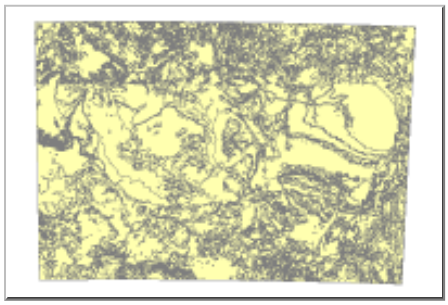
Binary Enclosures:

Thumbnail:
Enclosure type: Picture



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