New Mexico
Source Water Protection Atlas
GIS Mapping Application
User Manual and Tutorial
May 24, 2013

Introduction

U.S. Congress amended the Safe Drinking Water Act in 1996 to provide for the assessment and protection of sources of water supply. Section 1453 (a)(2)(A) of the amended statute requires the states to use, "all reasonably available hydrogeologic information on the sources of the supply of drinking water in the state and the water flow, recharge, and discharge…" The purpose of this Atlas is to make data publicly available and accessible. Providing online access to the tremendous amount of existing hydrogeologic information, complies with this statutory requirement. The Atlas also contains information on potential sources of contamination, both manmade and natural. Intended users of the Atlas include public water supply systems, municipalities, businesses, farmers, ranchers and homeowners, non-governmental organizations, and government agencies that have water-management responsibilities.

The Atlas was created by ongoing collaborative work between the N.M. Environment Department, the N.M. Bureau of Geology and the N.M. Department of Health, and was funded, in part, by the U.S. Environmental Protection Agency and by the Centers for Disease Control.

Data Layers

Existing data layers
Data layers to be added (subject to funding availability)

Base Map Data Layers

Layers visible when the Atlas opens:
- aquifer sensitivity (with option to change base map to streets, image, topographic, shaded relief or geology)
- County boundaries
- Primary secondary roads
- All roads

- Drinking water sources
- Lakes and streams

Layers that can be selected by user:
- Ability to change base map to streets, image, topographic, shaded relief or geology
- Water Fair data (tabulated into one spreadsheet for each community with personal info removed)
- Groundwater geochemistry database (public and private wells with relatively complete +/- ions, trace elements and metals data) with ability to plot Stiff Diagrams as a GIS layer
- Service areas for public water and sewer

Potential and Actual Sources of Contamination Data Layers

Layers visible when the Atlas opens:
- Animal feeding operations
- Abatement sites
- Brownfields
- Groundwater permits (both NMED and OCD)
- Hazardous waste facilities
- Underground storage tank facilities
- Leaking underground storage tank sites
- Landfills
- NPDES permits
- Solid waste facilities
- Voluntary remediation sites
- Impaired streams
- Impaired lakes
- Liquid waste permits (both NMED and Bernalillo County)
- Oil and gas wells/pits
- Mines
- Natural sources of contamination (geologic rock units and structures that are potential sources of arsenic, asbestos, fluoride, nitrate, radium, selenium, uranium)
- Areas of groundwater depletion and pumping-induced subsidence

Other Data Layers
- Public health and bio-monitoring data (at the regional, county or zip code scale)

Tutorial

1. Launch the Atlas: Go to the application http://gis.nmenv.state.nm.us/SWPA. The system will open with the aquifer sensitivity map as the base layer. Data layers showing roads, county boundaries and potential/actual sources of contamination will be overlain on the aquifer sensitivity map.
2. Explore the Legend: The legend column on the left shows all the data layers in the Atlas. The check box next to each layer indicates whether the layer is shown on the map screen; data layers can be turned on and off by clicking the check box.


3. Explore base map options: Only one base map can be used at any time, and the aquifer sensitivity is the default base map. Turn off the aquifer sensitivity map by clicking the check box to remove the check. The Atlas will now default to the Street Map (see the References section in the column to the left of the map window below the legend). In the

references section, sequentially click "Imagery" "Topographic Map" and "Shaded Relief" and observe the changes in the map. The base map can changed at any time while the Atlas is being used, and the user should select the base map that is most appropriate for the specific application. The "geology" layer also acts as a base map, but does not appear until the user has zoomed into an area of the state.

4. Hide the map overview window: The map overview window is in the upper right corner of the map screen. Click the arrow button in the upper right corner of this window to hide it. The map overview window can be reopened at any time by clicking the same arrow button again.
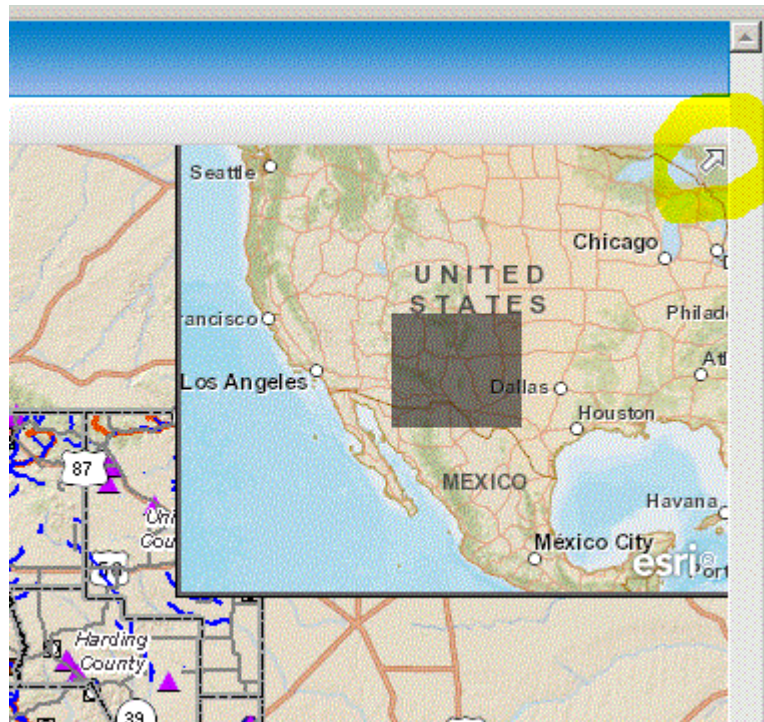
5. Explore the tool bar features (from left to right it the tool bar):
    a. Map Scale: The scale of the map window is shown in the box in the far left side of the tool bar. The map scale will be 1:2,311,162 when the Atlas boots up.
    b. Zoom in/out ⊕⊖: The magnifying glasses with the + and – symbols zoom in and out, respectively. Click the magnifying glass with the + symbol and then use the cursor to draw a rectangle anywhere on the map. The Atlas will zoom in to the area of the rectangle. A sliding zoom in/out bar also is located in the upper left area of the map screen, and the mouse wheel also can be used to zoom in and out within any given map screen.
    c. Pan 🖑: Click the hand icon and then click, hold and drag any location on the map to pan the map image. The Atlas will reload the map image after panning.
    d. Return to Full Extent or Global view 🌐: Click the Earth icon to return the Atlas to the statewide view and default settings.
    e. Fixed Zoom In/Out ⛶⛶: The buttons with four arrows pointing inward and outward from a square will zoom the map in or out of the current map screen image. This is the same effect as rolling the mouse wheel. The pan function can be used to center the map over an area of interest.

f. Identify Feature ⓘ: Click the blue circle with the "i" and then click on any map icon or anywhere on the map to get information about map features. An attribute box will open in the map screen and all the features that exist on the location that was clicked will be identified in tabs at the top of the box. Click the tabs to gain information about each feature.

g. Measure ⟺: The ruler icon turns on a tool that can measure the distance of a line or the area of a polygon that is drawn on the map with the cursor. Double click at the end of the line, or upon closure of the polygon. The line distance, or polygon area, are given in the lower left corner of the map screen, just above the latitude-longitude of the map cursor. The tool also has a drop-down list of measurement units, such as feet, miles, meters or kilometers for distance.

h. Go to XY ⊙: Latitude and longitude of a specific location can be entered in this tool to direct the map screen to that location.

i. Draw Circle ◯: This tool can be used to define source water assessment and protection areas around public water supply wells (purple triangles on the map). To draw a circle, click the circle icon in the tool bar, select a radius and distance and then click on any location in the map screen.

j. Locate 📪: The mailbox icon in the tool bar can be used to enter a street address and zoom the map in to that address. Enter an address of interest, or use the default address (NMED central office in Santa Fe).

k. Deactivate Cursor ✖: The red X icon will deactivate the cursor and delete a shape you have drawn with the Draw Circle tool.

6. Query for Drinking Water Systems:
The query tab is located next to the legend tab in the column to the left of the map screen. Open the query tab, enter the name of a water system of interest to you, and then click the "Search Drinking Water Source Names" button. The results of your search appear in the "Query Results" box in the lower column area, and include information on the water system.
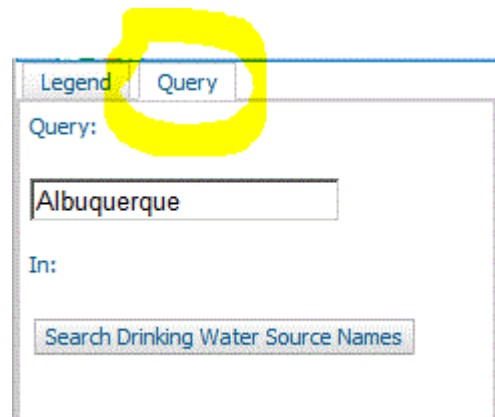
7. Find Latitude and Longitude of a Map Location: The latitude and longitude of the cursor location is given in the lower left area of the map screen, just above the scale.
For best viewing, turn off the aquifer sensitivity and geology map layers, and turn on the "Imagery" reference map. Zoom in to the area of interest, hover
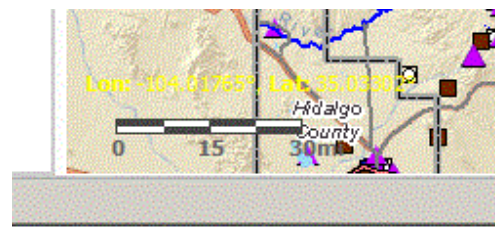
the cursor over the specific location of
interest, read the latitude and longitude.

8. <u>Copy and Save Map Image</u>: How to copy and save will depend on your operating system and web browser. This can be accomplished on some computers by right-clicking the map, selecting the "Save picture as" function and saving the image to the hard drive. Some computers have a snipping tool in the Start menu that can be used to copy and save all, or any part of, the map screen. From the hard drive, the image can be copied and pasted into documents and presentations.