Managing Ground Water Data - Just as Important as Gathering It

Marty Link - Acting WQ Div. Administrator
Nebraska DEQ
Interview Question:

If you had all the money / resources you needed, what would you do?
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If you had all the money / resources you needed, what would you do?

1. Fishing – in Canada, nice boat, great pole...
2. Travel - Europe, Africa, Australia
3. Make a DATABASE to manage all our ground water and surface water data. We would be able to get to it easily, it would be backed-up, do queries, make maps...
How to manage paper, maps, and chemistry results so anyone in the office, field, or state can use it - - -?
“Quality-Assessed Agricultural Chemical Database”

http://dnrdata.dnr.ne.gov/clearinghouse/
... or just “Clearinghouse”

Data quality assessed, “quality flag”
1 – 5 (5=best)

Flag based on things like

- sampling and lab QA
- well construction
- location accuracy

✓ started in 2000
✓ >420,000 data entries
✓ 28 entities have submitted data
✓ searchable

# Data Entries
- 96,053 Nitrate-N
- 18,702 Atrazine
- 17,831 Cyanazine
- 17,771 Metolachlor
Who is submitting GW Monitoring Data?

- 23 Natural Resources Districts
- Nebr. DEQ
- USGS
- University of Nebraska – Lincoln
- Nebr. D. of Ag
- Nebr. Health (CDC Study, not PWS data)
244,265/431,968
Analyses from Monitoring Wells
- 57%
16% from Domestic Wells
6% from PWS Wells
1% Commercial, Industrial, Livestock, Other

91,218/431,968 Analyses from Irrigation Wells - 21%
Well Type - Source of Analyses
DATA BANK MAPS AND DATA
Relational/Tabular Databases
RELATIONAL/TABULAR DATABASES

- Demographic Data
  - Decennial Census
  - Population Estimates
- Groundwater Data
  - Quality-Assessed Agrichemical Contaminant Database
  - Registered Groundwater Wells
- Nebraska Riverine Ice Status Reports
- Soils Data
- Surface Water Data
  - Dams Inventory
  - Peakflow
  - Reservoir Storage
  - DNR Stream & Canal Gaging
  - Surface Water Rights
Quality-Assessed Agrichemical Contaminant Database for Nebraska Ground Water

Please refer to the metadata which describes how the data were obtained, compiled, and ranked.

Selected Reports and Publications Prepared Using the Agrichemical Contaminant Database

Metadata file in PDF format can be viewed with Adobe Acrobat Reader.

The suggested citation for referencing this source is: "University of Nebraska-Lincoln, 2000. Quality-assessed Agrichemical Contaminant Database for Nebraska Ground Water. A cooperative project of the Nebraska Departments of Agriculture, Environmental Quality, and Natural Resources and the University of Nebraska-Lincoln. On-line at http://dnrdata.dnr.ne.gov/clearinghouse, updated Dec 6, 2010."

We invite you to send comments or suggestions about this website to csteels3@unlinfo.unl.edu

Query on:
1. Location/Source/Number
2. Chemical
3. Quality Flag
4. Sampling Date
5. Well Depth
6. Type of Well
7. GIS Projection

Fill out the following form to specify your search criteria and then press the Search button. All data meeting the search criteria will be listed (when the search is complete). If you would prefer you can retrieve the entire Clearinghouse Database.

It is in a Zipped Microsoft Access 2007 format and is about 9 Meg.
Last Updated: Dec 6, 2010
Use this tool to develop a query and view the spatial distribution of wells meeting the selected criteria
Criteria Screening Check Plot

OR

Proceed to obtain location, pedigree, and analytical data for each well meeting the criteria selected in #1–9.

1. Select Search Criteria:
   - County
   - NRD
   - Well Location
   - Agency Code
   - Clearinghouse Number
   - Registration Number
Ground Water Quality Data Query Results

Select by County

Search by County
County is Buffalo
Analytes Analyzed: nitrate-N
Quality Flag: All
Well Use(s): I
Projection or Location Points: none
Output Format: CSV
Sort Order
  NRD
  County
  Legal Description
Clearinghouse #: 9537
Number of records: 9537
You have requested a large number of records.
This could take several minutes to process.

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<th>Clearinghouse #</th>
<th>Well Location</th>
<th>NRD</th>
<th>County</th>
<th>Well Depth</th>
<th>Screen Depth</th>
<th>Well Use</th>
<th>Contaminant</th>
<th>Date Sampled</th>
<th>Concentration</th>
<th>Reporting Limit</th>
<th>Quality Flag</th>
<th>Registration</th>
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• Legislation in 2001 required Natural Resources Districts to submit GW Data to NDEQ, or their designee.
• And required NDEQ to produce an annual report.
And it gives us an opportunity to find cool Ground Water Related Photos!
Examples of **FABULOUS INFORMATION** in the 2011 Nebraska Groundwater Quality Monitoring Report

![Map showing nitrate levels with various markers for different concentration ranges.](image)

**Figure 5.** Last recorded concentration of nitrate from 1974 - 2010. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)
Explaining the DANGERS of Data Comparison

Figure 8. Median and mean of nitrate from 1981.

1981 Focus in on 24 wells in Hall Co.
- 40% of data,
- from only 17% of that year's 143 wells

Figure 9. Sampling locations for nitrate in 1981. Red Circle indicates location of 24 wells sampled in Central Nebraska. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)
All 80 samples from the 24 wells

Min. & Max. from each of the 24 wells

Figure 10. All 80 samples collected from 24 wells in Central Nebraska in 1981. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)

Figure 11. Samples collected from 24 wells in Central Nebraska in 1981 indicating the high and low concentration from each well. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)
Statewide Number & Median of Nitrate Analyses
1974 - 2010

Figure 13. All 96,053 analyses and median nitrate-nitrogen levels for Nebraska, 1974-2010.
(Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)

96,053 nitrate analysis, 1974 - 2010
Figure 21. Location of 4,803 wells sampled for atrazine from 1974 – 2010. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)

Figure 22. Last recorded concentration of atrazine from 1974 – 2010. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)
Statewide GW Mon. Network - ~ 1391 wells
Sampled Annually (or try to sample annually)
HOW MUCH DOES THIS COST??????

• NDNR - web - $0 to us, part of their state water data mission
• NDofAg - Pesticide - ~$30,000/yr (EPA-FIFRA)
• NDEQ - Nitrate - ~$30,000/yr (EPA-319 + State$)
• UNL - ~$35,000 (?) Non-federal Match
Really IMPORTANT
To Manage Your
Ground Water Data
Discussion Time:

How does your state manage its Ground Water Data?