GTILO

Vicki S. McConnell, State Geologist

Oregon Department of Geology and Mineral Industries

Presented by: Clark Niewendorp, Mineral Resources Geologist

Geothermal Resource Information Layer for Oregon

Geothermal Working Group

What is this Project About?

- **Statewide database of geothermal systems**
- **Downloadable geothermal data**

This work is supported by the Department of Energy under Grant No. DEFG36-04R021599 and an Interagency Agreement with the Oregon Department of Energy and DOGAMI, No. I07075

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Tasks:

Compile DOGAMI's geothermal data

GIS compatibility

Interactive Website

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

The software used to build the map page is Map-Fu (http://sourceforge.net/projects/map-fu/) developed as part of the Oregon Sustainable Community Digital Library (OSCDL) by Academic & Research Computing at Portland State University.

Co-authors: Deb Schueller and Tim Welch

So, what does *GTILO* look like?

www.bowhunting.net

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

State of Oregon

OregonGeology

GTILO - Geothermal Information Layer for Oregon

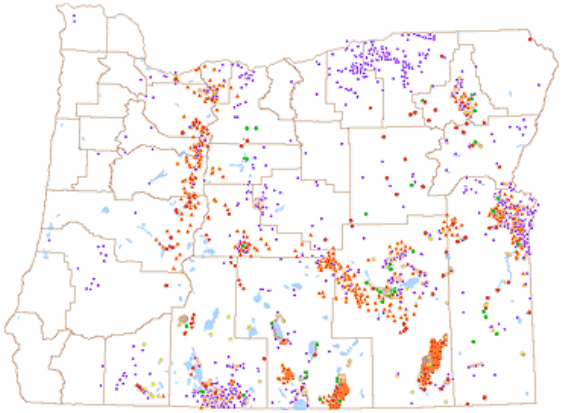
OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

What is the Geothermal Information Layer for Oregon?

The interactive GTILO map lets you view information on location, temperature, and other features of thermal springs and wells (geothermal exploration, geothermal test, and water wells) as well as known geothermal resource areas and direct-use areas.
More background information.

What do I need to view the map?

To view the map, **your browser must be JavaScript enabled**, and if you are using Internet Explorer, allow ActiveX controls. The map itself is image intensive. Users with slower internet connections may find that resizing the browser window to a smaller size will help the map image load faster. If you are unfamiliar with online map tools, please read the help file first. Access the interactive map using one of the methods to the right.



GO TO MAP

Map
Help
Download Geothermal Data
Additional Resources
Funding
Disclaimer

Website woes? Email webmaster@dogami.state.or.us

OregonGeology | Nature of the Northwest

www.oregongeology.com

Virtual tour...

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007

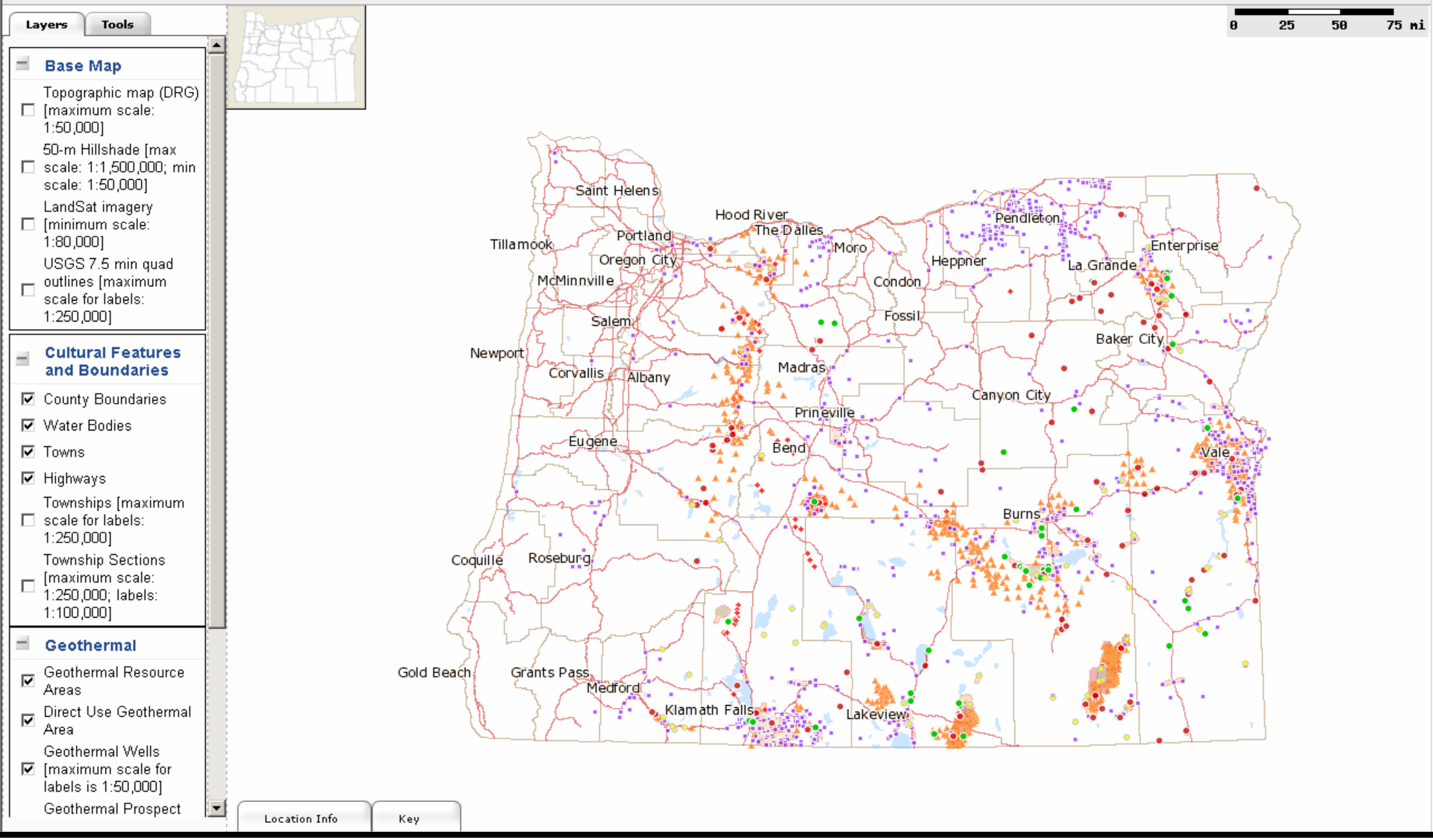
State of Oregon

Oregon Geology

Geothermal Information Layer for Oregon (GTILO)

OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

introduction | help | background | download data | disclaimer | resources | tell us what you think



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

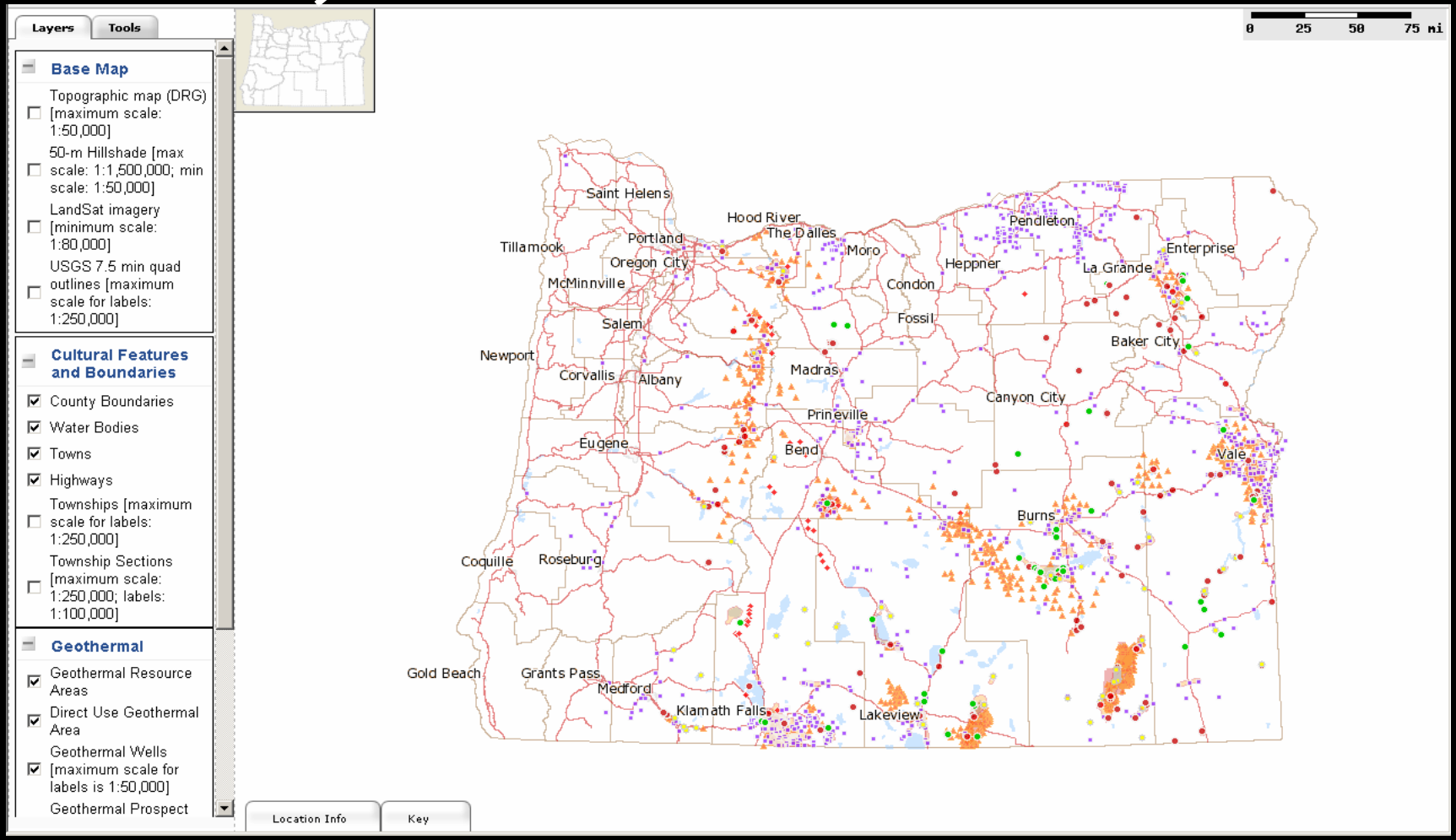
Oregon Geothermal Working Group

July 23, 2007

Layers and Tools tab

location box

scale bar

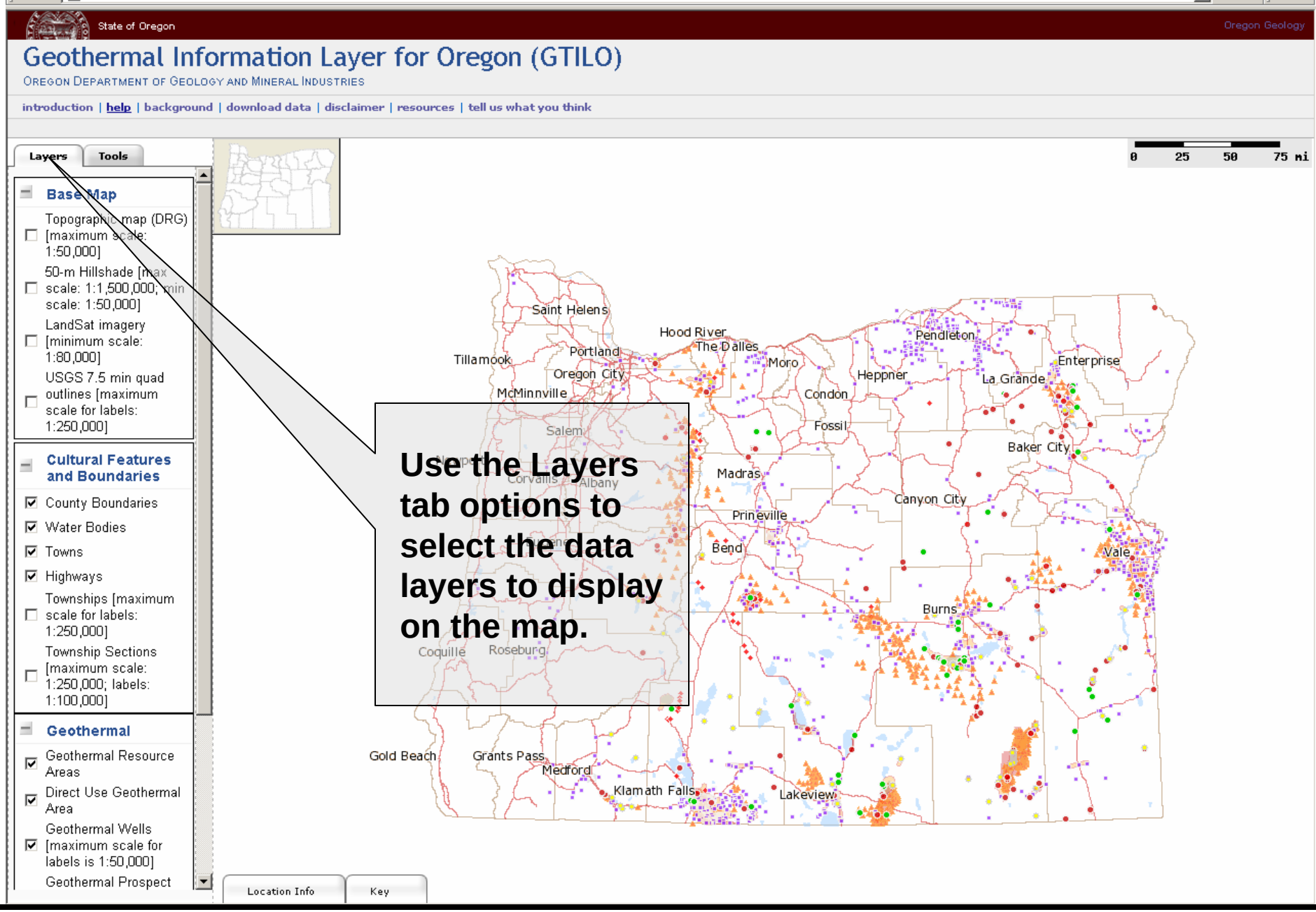


popup Mapinfo, Key (Legend), and Info Query Tab

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

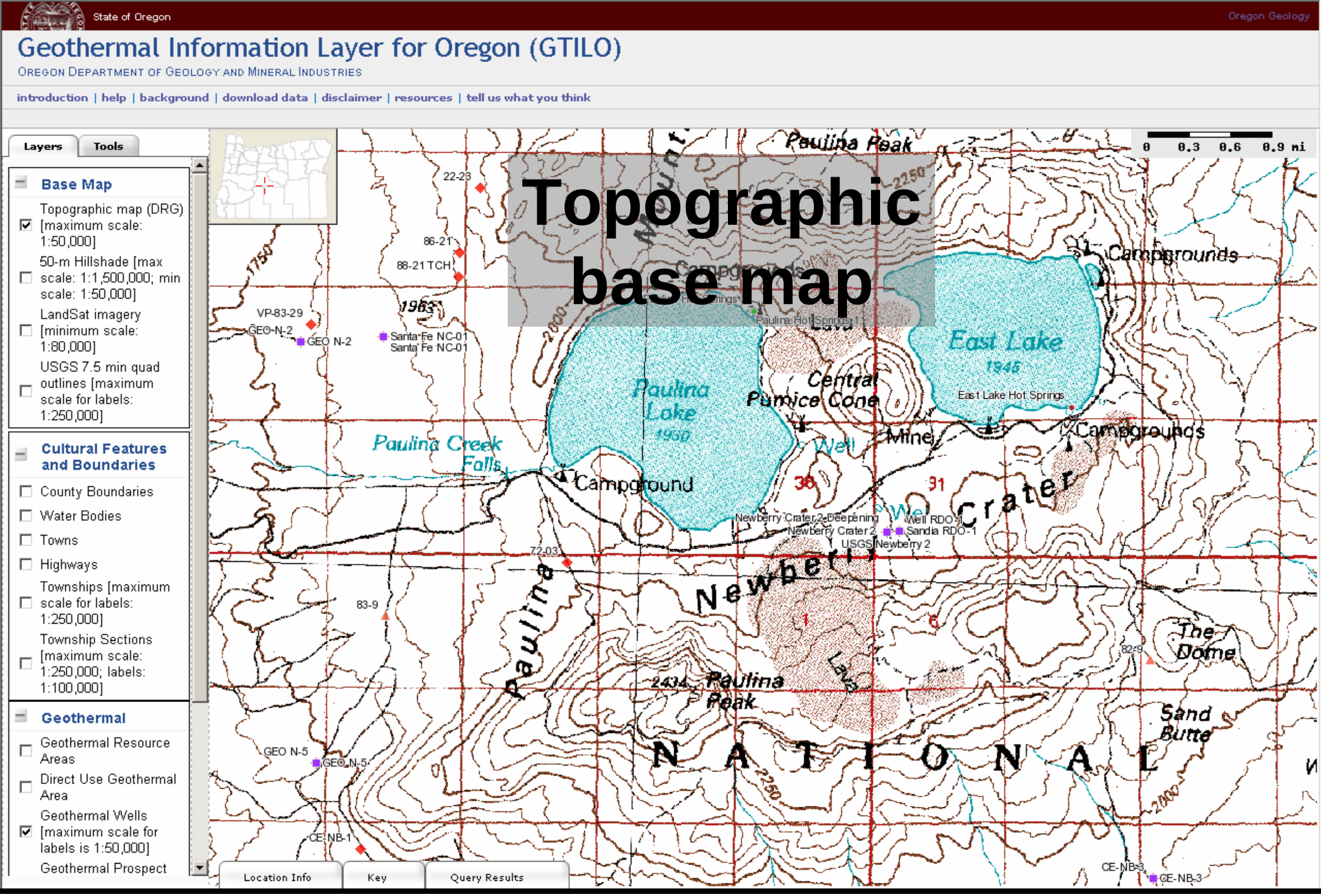
July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

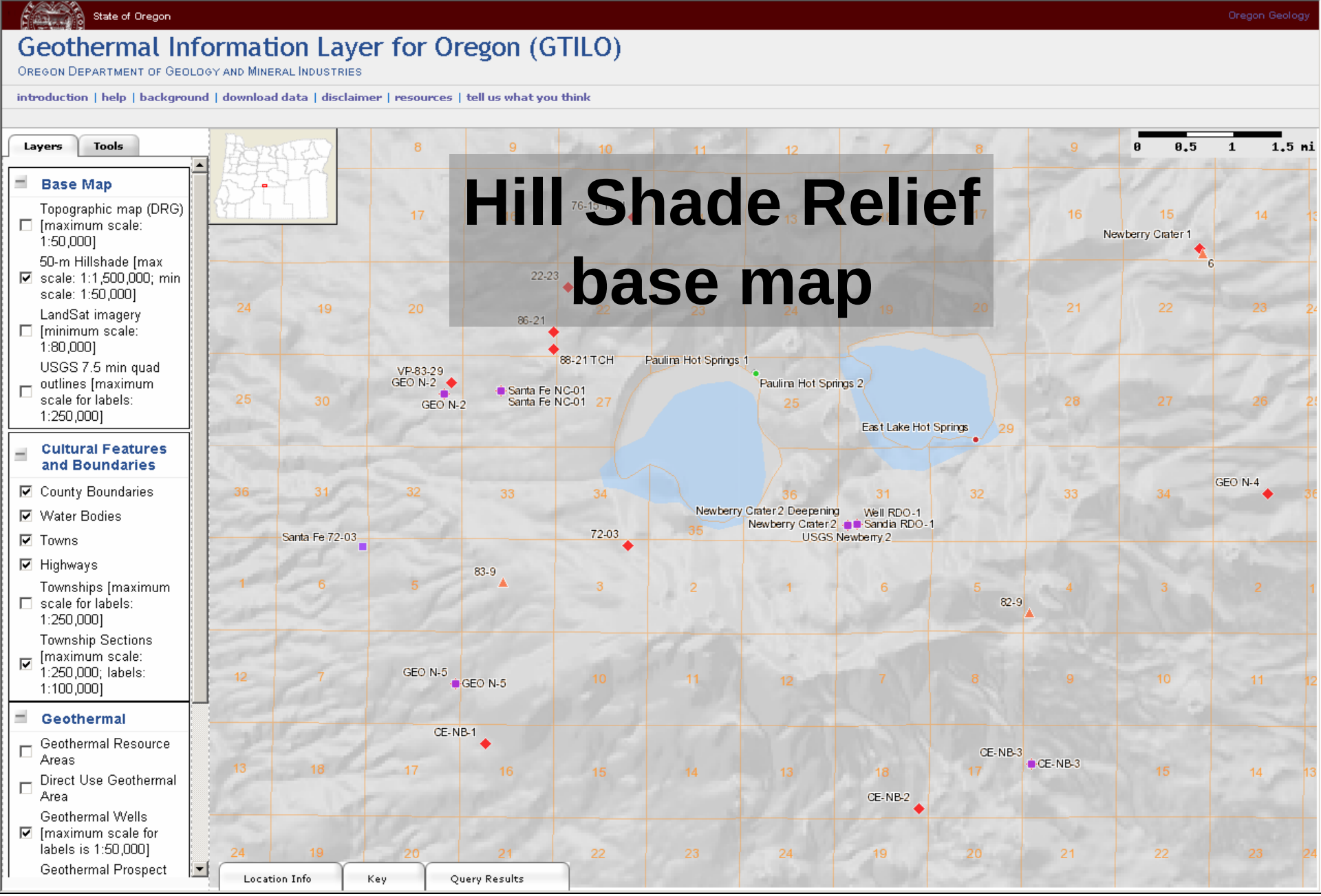
July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

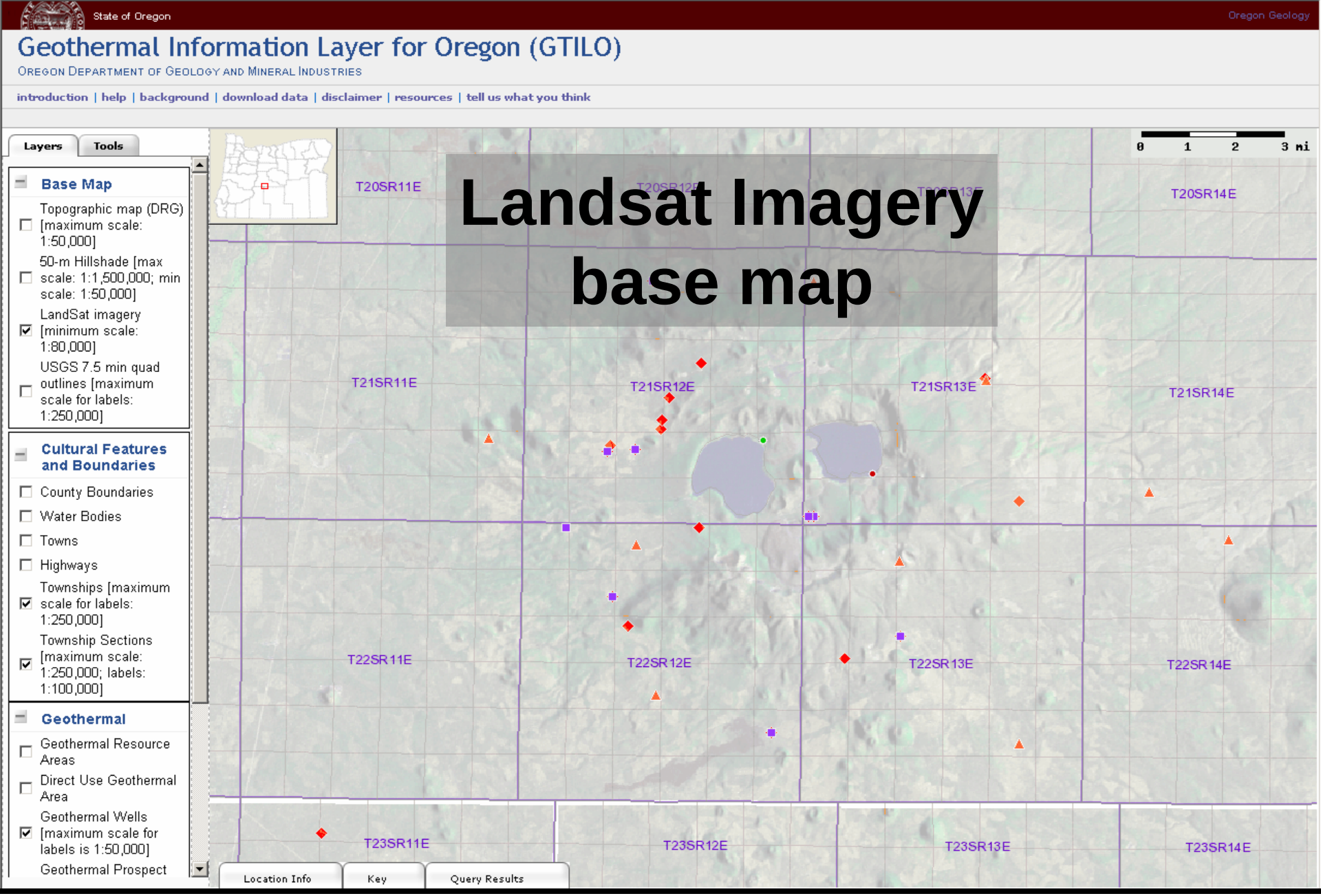
July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

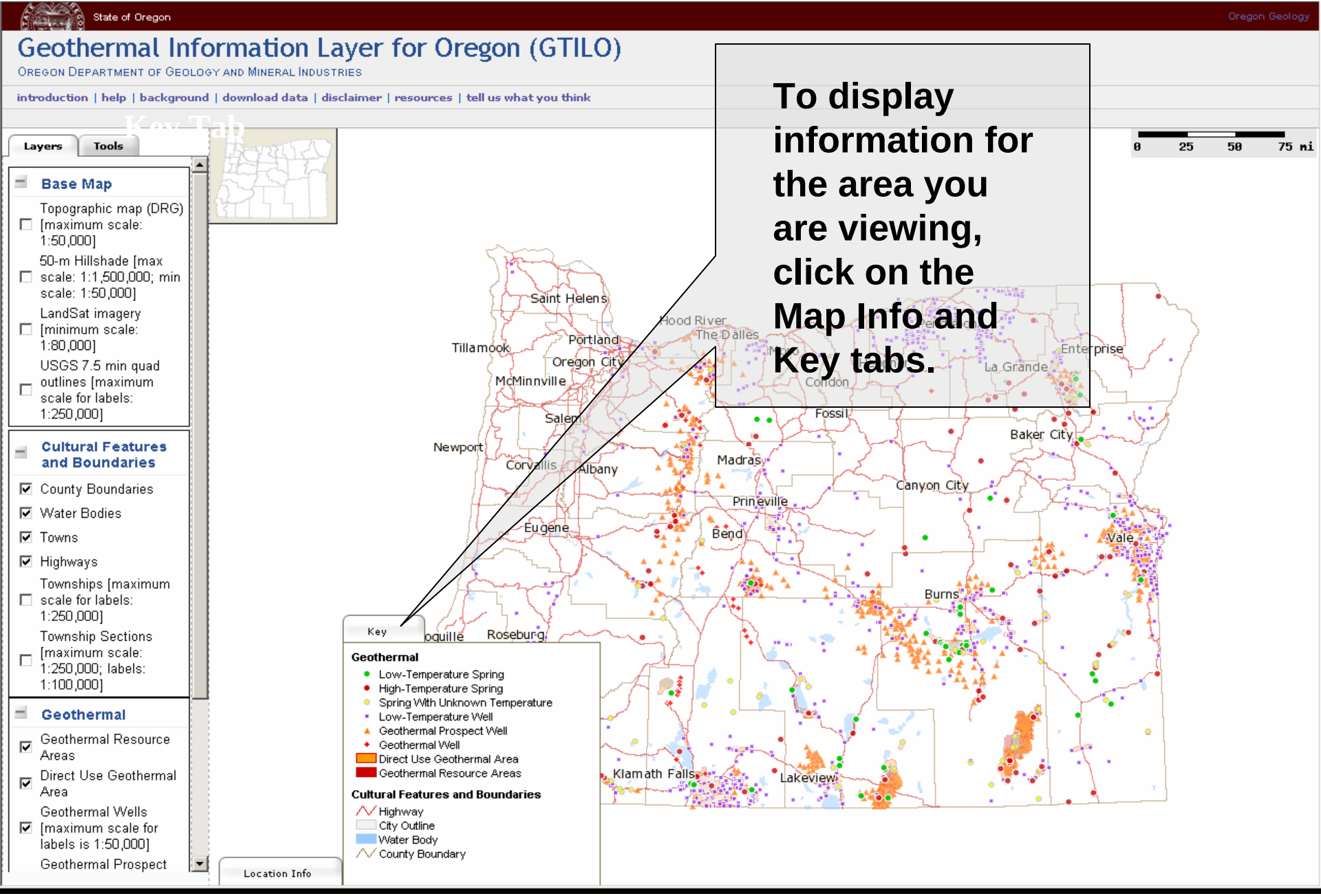
July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

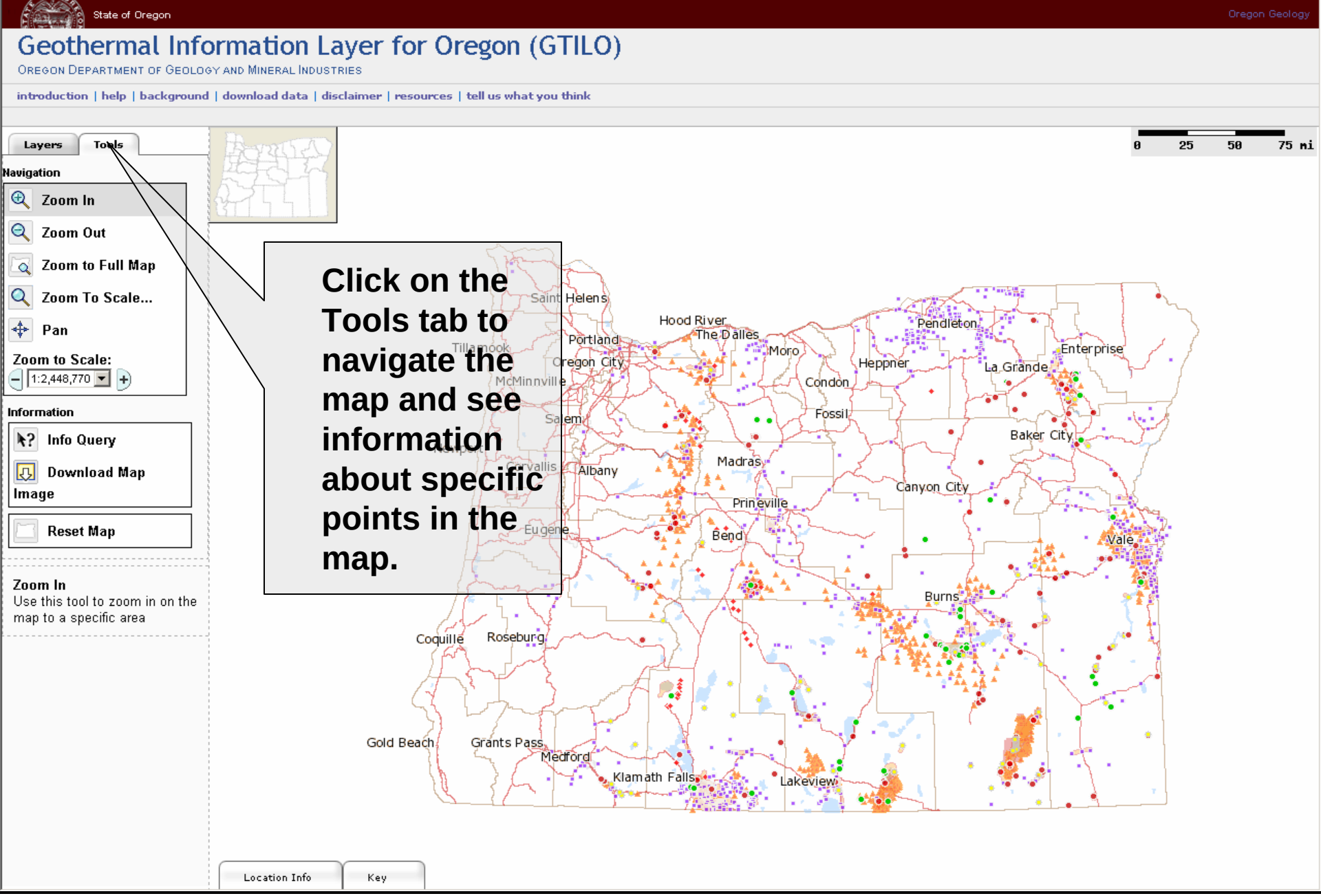
July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

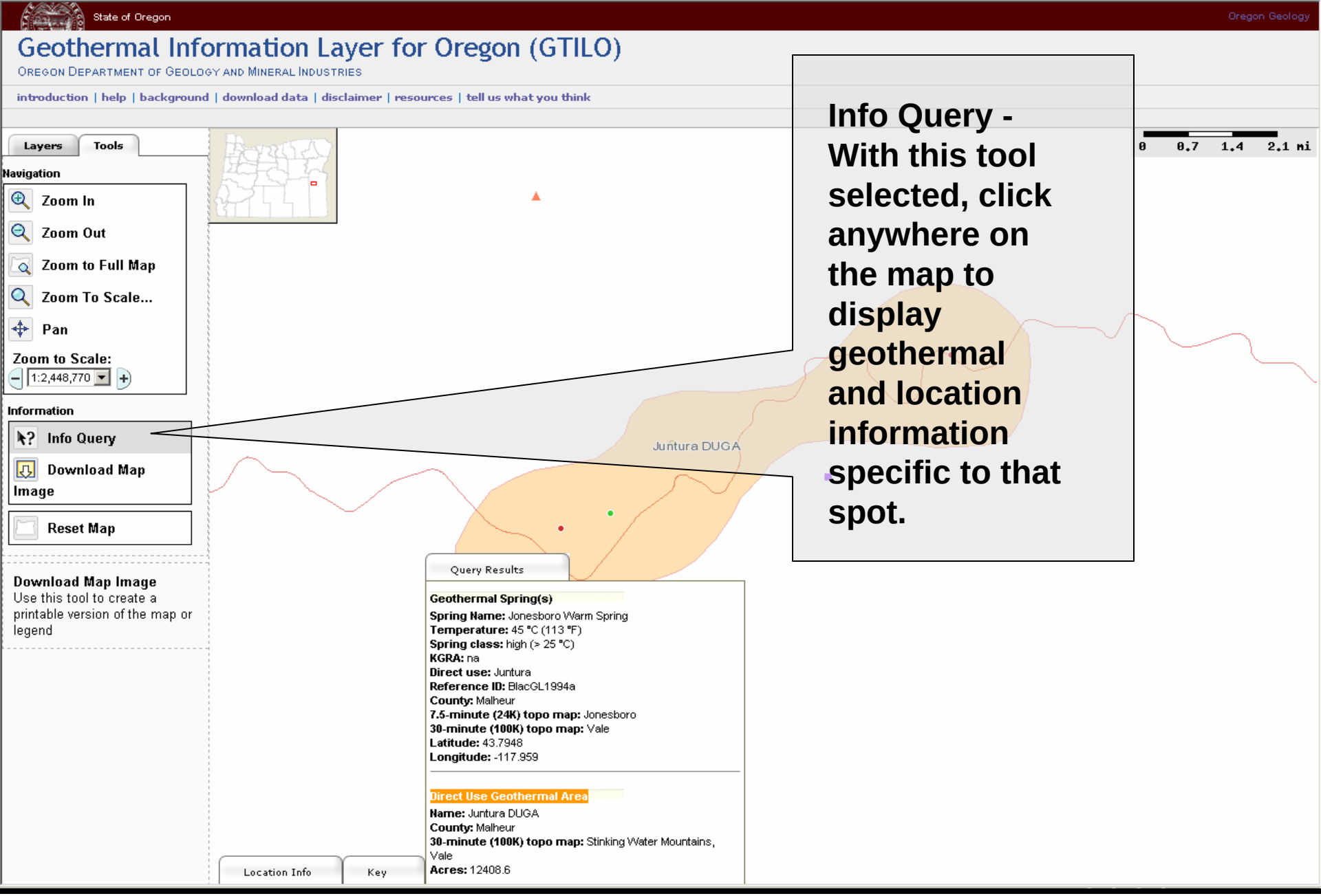
July 23, 2007



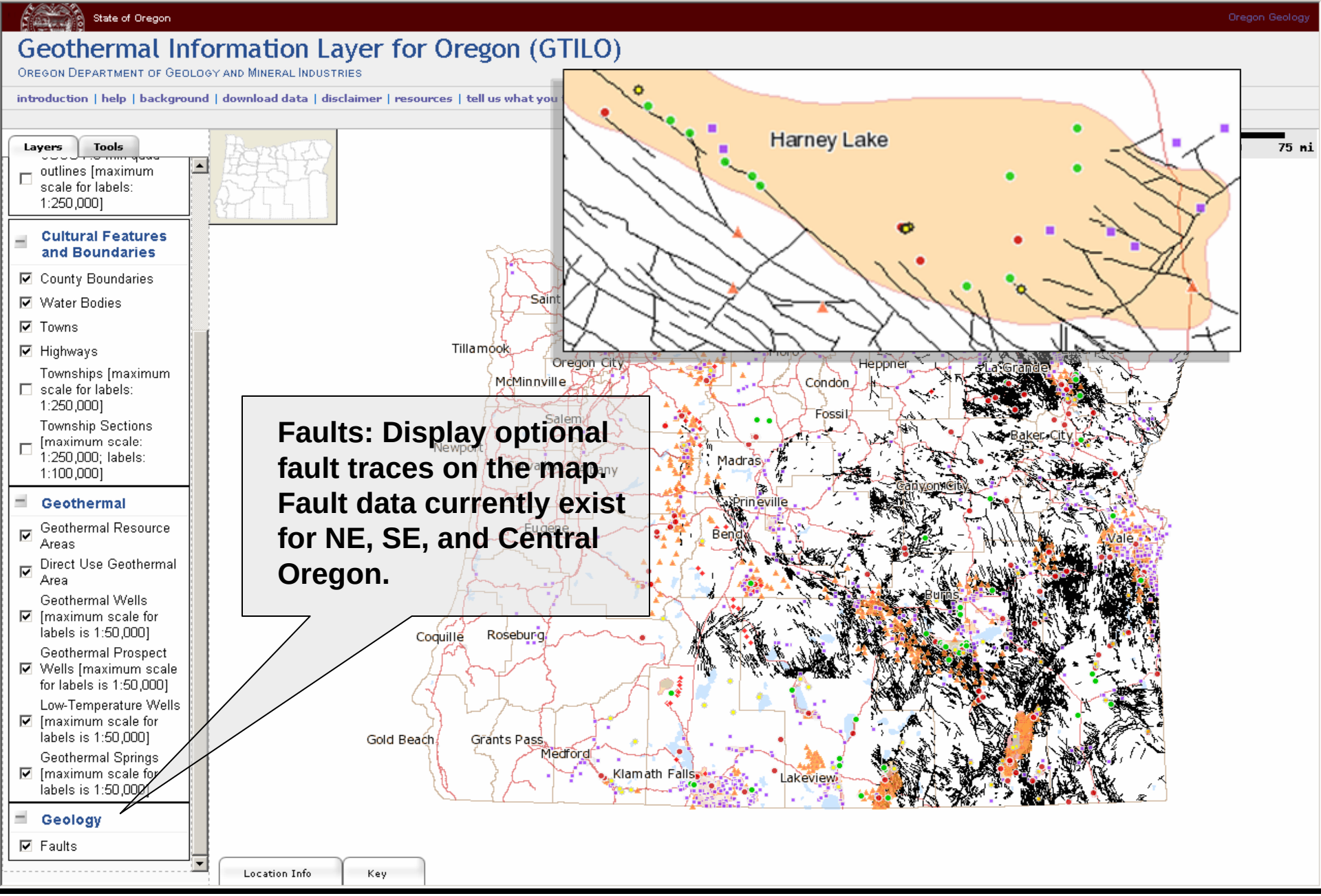
Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007

What does *GTILO* offer?

http://cozart.org/images/lightning.jpg

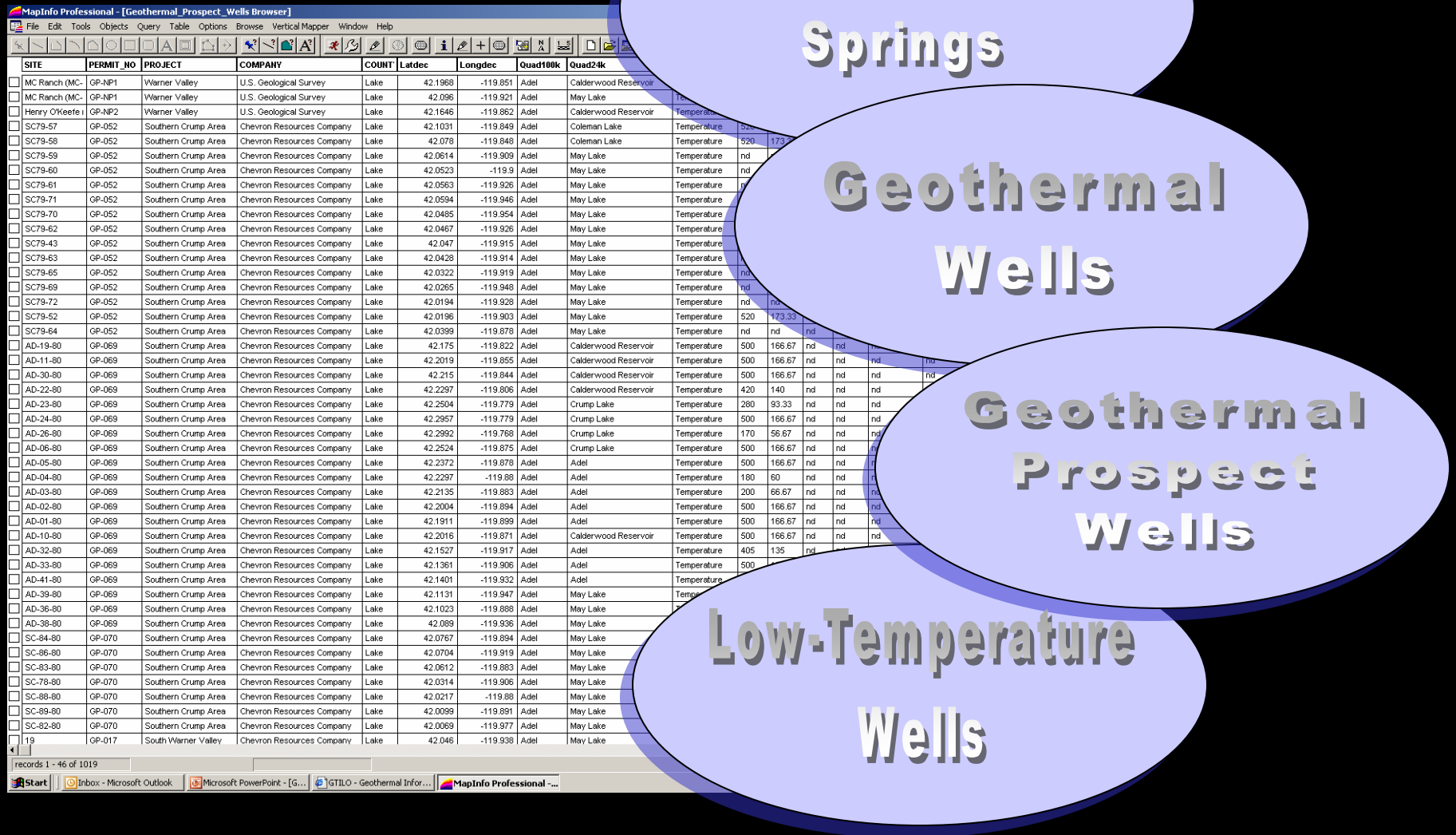
cozart.org

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007

GTILO coverages...



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007

Source Data

^ TOP

See Download Data for full GTILO reference information. Note that some sources, such as Brown et al., 1980, contain multiple plates or figures. Each plate or figure counts as one source. You can use the Info Query tool on the web map to see the Reference ID of the source data used at any particular location on the compilation map. DOGAMI source publications are available for viewing at state university libraries and at DOGAMI main and branch office libraries. You can purchase DOGAMI source publications from Nature of the Northwest.

Reference ID	Reference
AMAX1998a	Amax Exploration, Inc., 1998 data release, Beulah, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, map and lithology data, Holes B 1-14, 1975. (AMAX-5).
AMAX1998b	Amax Exploration, Inc., 1998 data release, Burns, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, map and lithology data, Holes BN 1-13, 1975. (AMAX-8).
AMAX1998c	Amax Exploration, Inc., 1998 data release, La Grande, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, map and lithology data, Holes LG 1-14, 1975. (AMAX-7).
AMAX1998d	Amax Exploration, Inc., 1998 data release, North Vale, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, map and lithology data, Holes NV 1-18, 1975. (AMAX-2).
AMAX1998e	Amax Exploration, Inc., 1998 data release, Vale, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, map and lithology data, [illegible] V 1-19, 1975. (AMAX-1).
AMAX1998f	Amax Exploration, Inc., 1998 data release, Wagontire, Oregon, Temperature-depth, gradient, thermal conductivity, heat flow, and ma[illegible] for 11 [illegible]s AMS).
AresJF1998	Arestad, J.F., R.W. Potter II, and G.E. Stewart, Stratigraphic test drilling in the Newberry Crater KGRA, Oregon, Geothermal Resources [illegible]ncil B[illegible]tin, [illegible]8, Nov. 1988. (M43).
AshwMS1982	Ashwell, M.S., 1982, Thermal springs near Madras, Oregon, Oregon Geology v. 44, n. 01.
AyreFR1951	Ayres, F.D., and Creswell, A.E., 1951, The Mount Hood Fumaroles, Mazama, v. 33, n. 13, p. 33-40.
BacoCR1983	Bacon, C.R., 1983, Eruptive history of Mount Mazama, Cascade Range, U.S.A., Journal of Volcanology and Geoth[illegible]sea[illegible]ch [illegible]1[illegible], 57-115.
BacoCR1996	Bacon, C. R., and Nathenson, Manuel, 1996, Geothermal resources in the Crater Lake area, Oregon: U. S. G[illegible]gical Su[illegible] O[illegible]-Fi[illegible] Report 96-663, 34 pages
BargKE1990	Bargarv, K.E., 1990, Hydrothermal alteration in geothermal drill hole CTGH-1, High Cascade Range, Oregon, [illegible]on Geol[illegible] v. 52, n. 04.
BargKE1994	Bargarv, K.E., 1994, Hydrothermal alteration in the SUNEDCO 58-28 geothermal drill hole near Breitenbush Hot [illegible]ings, O[illegible]gon, Oregon Geology v. 56, n. 04.
BargKE1999	Bargar, K.E., and Keith, T.E., 1999, Hydrothermal mineralogy of core from geothermal drill holes at Newberry volc[illegible]egon, U.S. Geological Survey professional paper 1578, p. 83-86.
BarrW1980	Barrish, W., Bond, J.G., Kauffman, J.D., and Vendatakrishnan, R., 1980, Geology of the La Gran[illegible] Oregon, Oregon Department of Geology and Mineral Industries.
BenoWR1983	Benoit, W.R., 1983, An explorationist viewpoint of the high-temperature geothermal potential o[illegible] Cascade range in Oregon, Geothermal Resources Council Transaction, v. 7, p. 227-232, 1983.
BensSM1984a	Benson, S.M., et. al., 1984, Data from pumping and injection tests, and chemical san[illegible]ng in the ge[illegible]rmal aquifer at Klamath Falls, Oregon U.S. Geological Survey Open-File Report OFR 84-146.
BensSM1984b	Benson, S.M., Sammel, E.A., Solbau, R.D., and Lai, C.H., 1984a, Interpretati[illegible]f aqui[illegible]data, U.S. Geological Survey Water-Resources Investigations Report 84-4216, p. 5.1-5.55.
BergJW1967a	Berg, J.W., Jr., and Thirvuvathukal, J.W., 1967, Gravity maps of Orego[illegible]nsho[illegible]and offshore, Oregon Department of Geology and Mineral Industries Geologic Map Series GMS-4.
BergJW1967b	Berg, J.W., Jr., and Thirvuvathukal, J.W., 1967, Complete Bougu[illegible] Gravit[illegible]nom[illegible] Map of Oregon, Oregon Department of Geology and Mineral Industries Geologic Map Series GMS-4-b, map.
BerrDA1984	Berri, D.A., 1984, Geology and Hydrothermal Alteratio[illegible]tte[illegible]neast Oregon, Oregon Geology v. 46, n. 08.
BerrGW1980	Berry, G.W., Grim, P.J., and Ikelman, J.A[illegible] The[illegible]al sprin[illegible]list for the United States, National Oceanic and Atmospheric Administration Documentation 12.
BlacDD1969	Blackwell, D.D., 1969, Heat flow deter[illegible]ations in the [illegible]thwe[illegible]rn United States, J. Geophys. Res., 74, 992-1007, 1969.
BlacDD1978	Blackwell, D.D., Hull, D.A., Bowen, R.G[illegible] [illegible].L., 1978, Heat flow of Oregon, Oregon Department of Geology and Mineral Industries Special Paper 4, 42 p. 1 pl., 1:1,000,000.
BlacDD1979	Blackwell, D.D., 1979, Heat flow and geothermal gr[illegible]ent study of the Newberry Volcano and vicinity, Central, Oregon, Report for OXY Geothermal, Inc., p. 25, Mar. 1979. (M20).
BlacDD1981a	Blackwell, D.D., Black, G.L., and Priest, G.[illegible], Geothermal gradient data for Oregon, 1981, Oregon Department of Geology and Mineral Industries Open-File Report O-81-03, 3 parts (a, b, and c), 374 p.
BlacDD1981b	Blackwell, D.D., 1981, Aspects of low temperature geothermal resource assessment with examples from Kansas and Oregon, p. 1-22, Glenwood Springs Tech. Conf. Proc. I, U. S. Dept. Energy Rep. DOE/ID/12079-39 ESL-59. (DR22)
BlacDD1982a	Blackwell, D.D., Black, G.L., and Priest, G.R., 1982, Geothermal gradient data for Oregon (1981), 1982, Oregon Department of Geology and Mineral Industries Open-File Report O-82-04, 430 p.
BlacDD1982b	Blackwell, D.D., Bowen, R.G., Hull, D.A., Riccio, J., and Steele, J.L., 1982, Heat flow, arc volcanism, and subduction in central Oregon, Journal of Geophysical Research, v. 87, p. 8735-8754
BlacDD1986a	Blackwell, D.D., Black, G.L., and Priest, G.R., 1986, Geothermal gradient data for Oregon (1982-1984), 1986, Oregon Department of Geology and Mineral Industries Open-File Report O-86-02, 107 p.

GTILO - Geothermal Information Layer for Oregon

OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Download Data

Geothermal Layer Data

Download GTILO release 1.zip - as of June 28, 2007 (438 KB zip file)
(includes .shp and .tab files for Known Geothermal Areas (KGRAs), Direct Use Geothermal Areas, Geothermal Exploration Permit (Prospect) Wells, Geothermal Exploration Permit Wells, Geothermal (hot and warm) Springs, Low-Temperature Wells, plus metadata files)

View Metadata: HTML file; text file; XML file as of June 28, 2007

Geophysical Logs

- Excel spreadsheet as of June 28, 2007 (18KB) - list of permit numbers, hole numbers, companies, and related data for geothermal geophysical logs that you can download in the following zip files.
- DOGAMI Open-File Report O-94-09.zip (351 KB zip file)- geochemistry of selected thermal springs and wells, compiled 19
- Geothermal geophysical logs in PDF format grouped into zip files by well name as of June 28, 2007. Note: More logs will be added as they as scanned.

23-22.zip	(58445 KB)
76-15_TCH.zip	(28680 KB)
86-21.zip	(134470 KB)
Breitenbush_58-28_South.zip	(52300 KB)
CE-NB-3.zip	(1447 KB)
CE-NB-4.zip	(3322 KB)
CTGH-1.zip	(114140 KB)
ESI-A-S-ALT.zip	(69751 KB)
Favell-Utley_1.zip	(66203 KB)
Geo_N-1.zip	(134374 KB)
Geo_N-2.zip	(161711 KB)
Geo_N-3.zip	(11 KB)
Geo_N-5.zip	(851 K)
Glass_Butte_Stratigraphic_Test_1.z	(12)
Magma_La_Grande_1.zip	80980 KB)
Old_Maid_Flat_1.zip	(173736 KB)
Old_Maid_Flat_7A.zip	(431698 KB)
Ore-Ida_1.zip	(357490 KB)
Pucci_Chairlift_55-7.zip	(15624 KB)
Pueblo_Valley_25-22A_Deepening.zip	(23320 KB)
Pueblo_Valley_52-22A.zip	(17976 KB)

Offers GIS Capabilities...

ESRI

ArcReader
ArcGIS Desktop Viewer

Grass GIS

SEND
HELP

MapInfo

MapInfo ProViewer

Quantum GIS

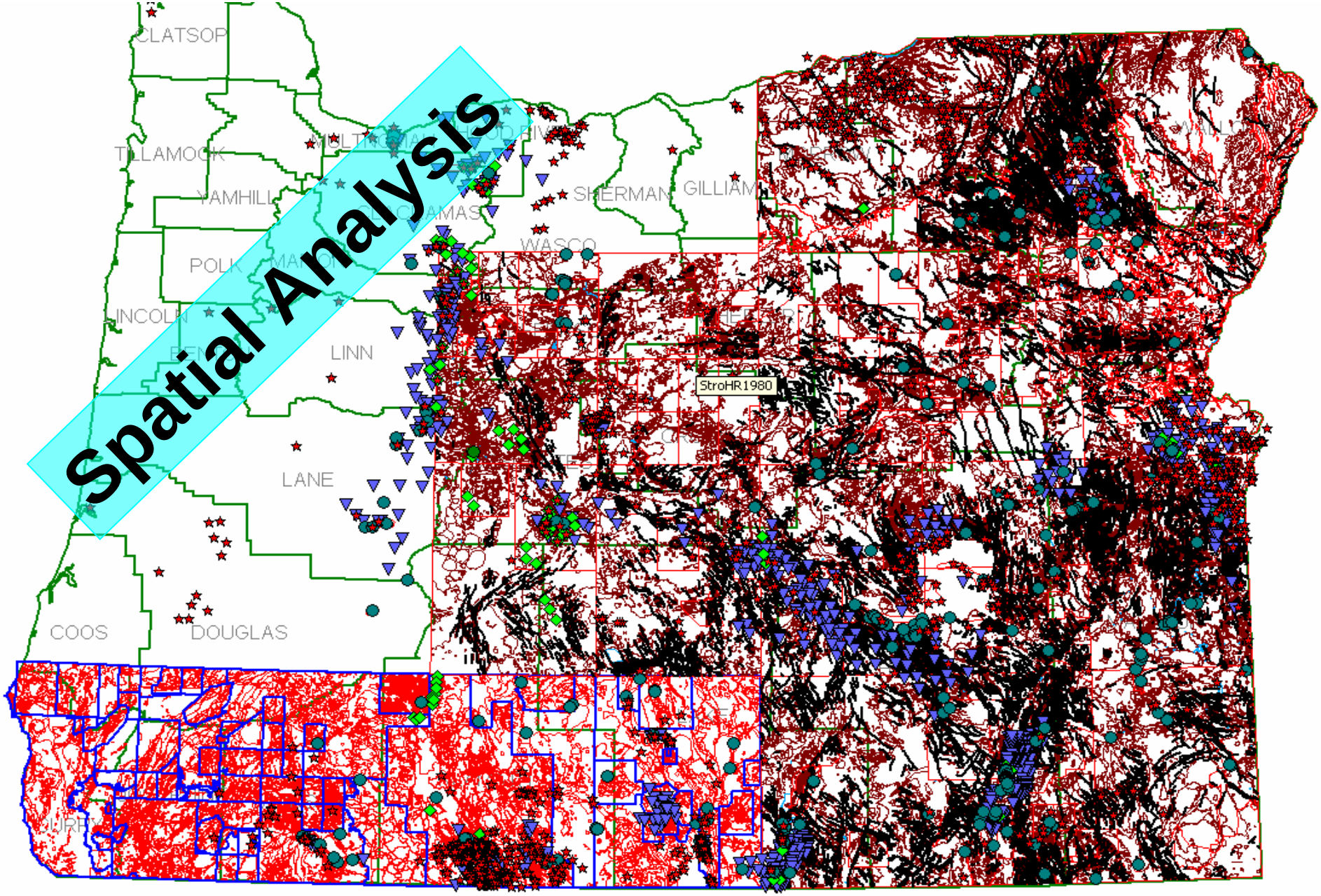
INTERGRAPH

GeoMedia®

manifold.net

Not a product endorsement

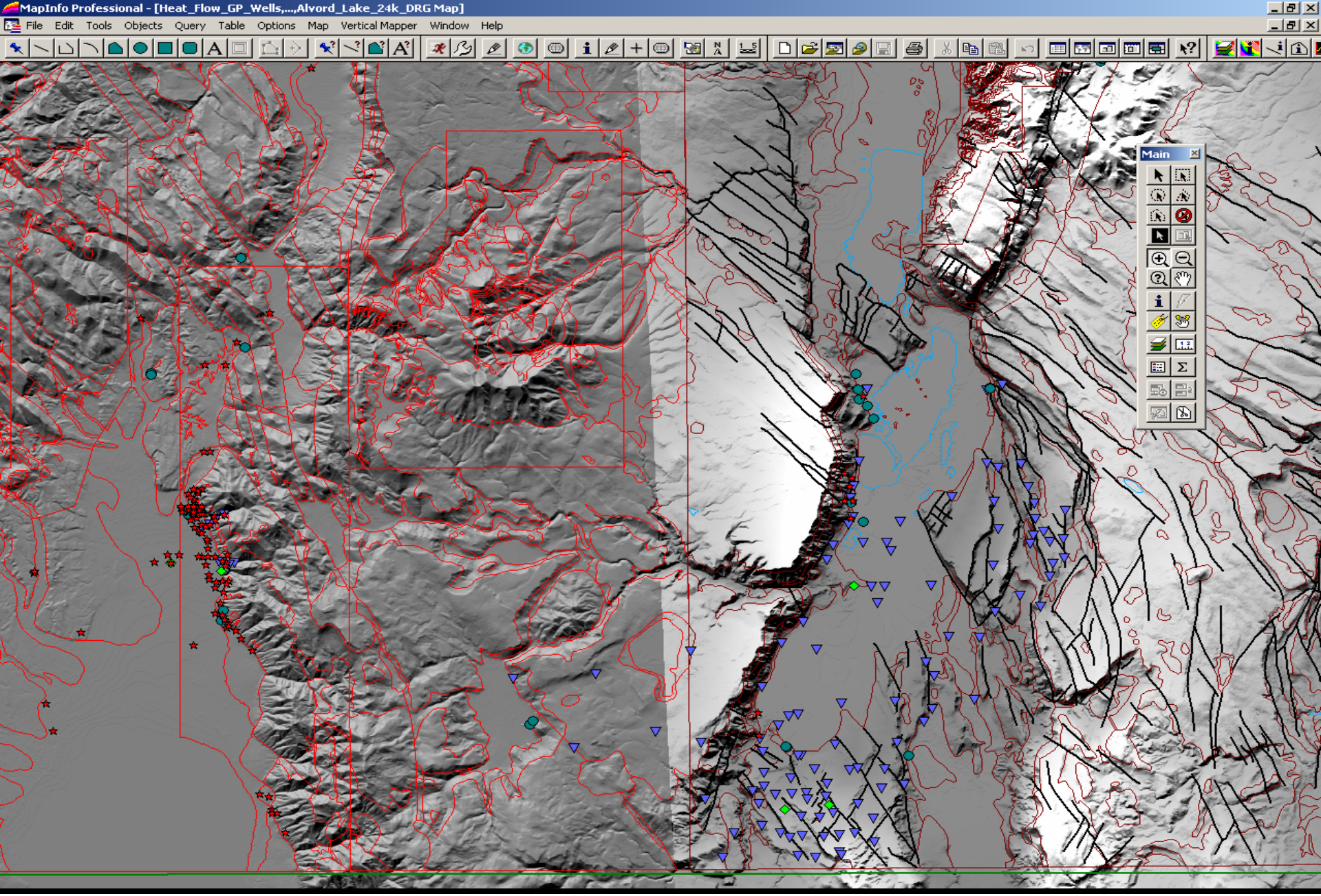
Clark Niewendorp
Oregon Department of Geology and Mineral Industries



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007



Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Oregon Geothermal Working Group

July 23, 2007

What's

Next?

Clark Niewendorp
Oregon Department of Geology and Mineral Industries

Web interface improvements

Temperature and depth database

Compiled geochemistry database

Updated low-temperature database

Scanning - well records & permits

Oregon Department of Geology and Mineral Industries

Clark Niewendorp

Tele: 971-673-1540

Email: Clark.niewendorp@dogami.state.or.us

“No activity, whether building, landscaping, producing art, or breathing, is without environmental consequences! Whether we like it or not, we extract (resources) to be able to live, even to be able to protest extraction.” (Ron Geitey)