

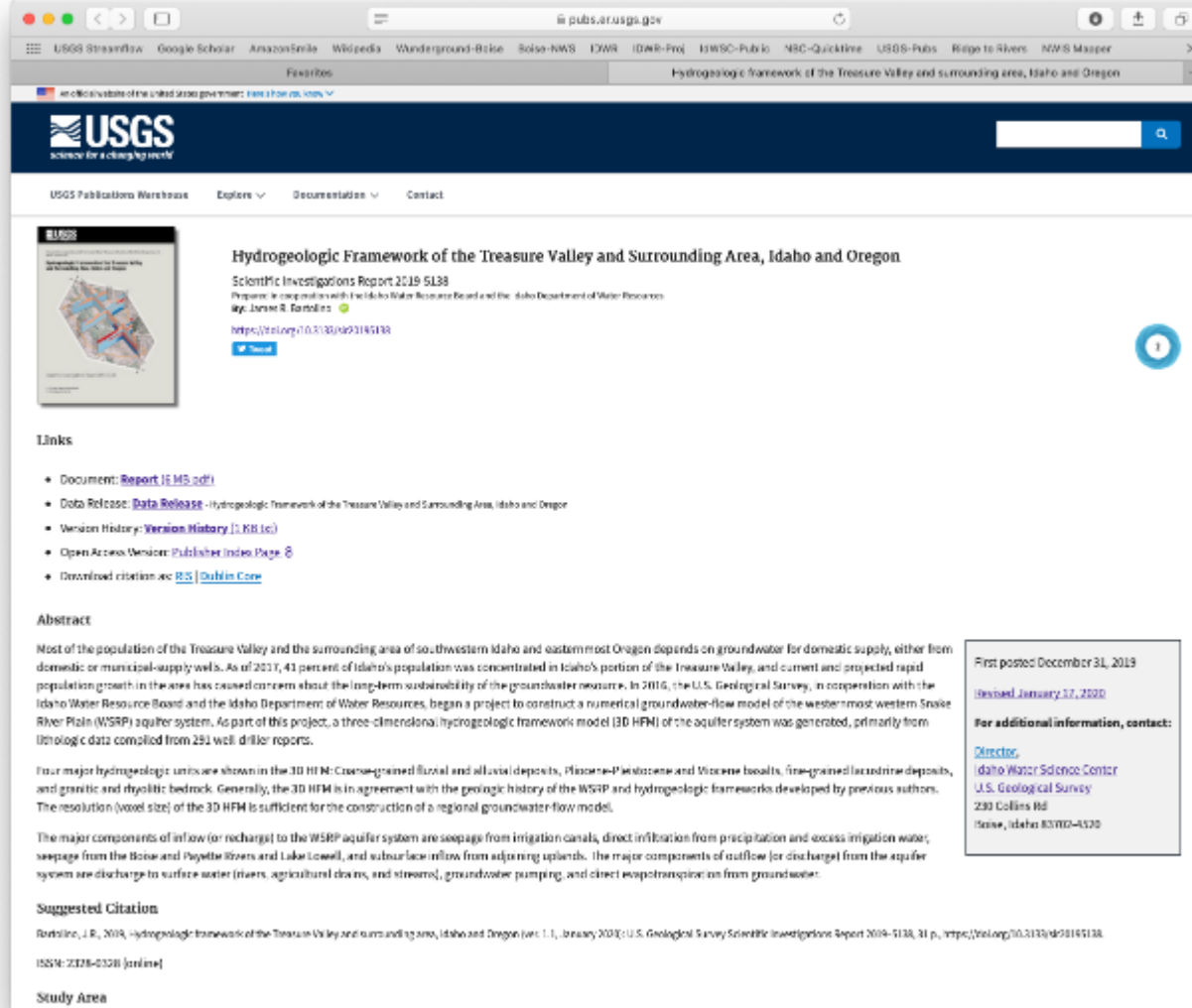
Hydrogeologic framework status, POD well data, & NY Canal seepage data, Treasure Valley, Idaho



Jim Bartolino
U.S. Geological Survey
Idaho Water Science Center
March 5, 2020

HYDROGEOLOGIC- FRAMEWORK REPORT STATUS

Hydrogeologic framework report: done



USGS
science for a changing world

Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon

Scientific Investigations Report 2019-5138
Prepared in cooperation with the Idaho Water Resource Board and the Idaho Department of Water Resources
By: James R. Bartolino

<https://doi.org/10.3133/sir20195138>

First posted December 31, 2019
Revised January 17, 2020

For additional information, contact:
Director,
Idaho Water Science Center
U.S. Geological Survey
230 Collins Rd.
Boise, Idaho 83702-4520

Abstract
Most of the population of the Treasure Valley and the surrounding area of southwestern Idaho and easternmost Oregon depends on groundwater for domestic supply, either from domestic or municipal-supply wells. As of 2017, 41 percent of Idaho's population was concentrated in Idaho's portion of the Treasure Valley, and current and projected rapid population growth in the area has caused concern about the long-term sustainability of the groundwater resource. In 2016, the U.S. Geological Survey, in cooperation with the Idaho Water Resource Board and the Idaho Department of Water Resources, began a project to construct a numerical groundwater-flow model of the westernmost western Snake River Plain (WSRP) aquifer system. As part of this project, a three-dimensional hydrogeologic framework model (3D HFM) of the aquifer system was generated, primarily from lithologic data compiled from 281 well driller reports.

Four major hydrogeologic units are shown in the 3D HFM: Coarse-grained fluvial and alluvial deposits, Pliocene-Pleistocene and Wisconsin loessils, fine-grained lacustrine deposits, and granitic and rhyolitic bedrock. Generally, the 3D HFM is in agreement with the geologic history of the WSRP and hydrogeologic frameworks developed by previous authors. The resolution (voxel size) of the 3D HFM is sufficient for the construction of a regional groundwater-flow model.

The major components of inflow (or recharge) to the WSRP aquifer system are seepage from irrigation canals, direct infiltration from precipitation and excess irrigation water, seepage from the Boise and Payette Rivers and Lake Lowell, and subsurface inflow from adjoining uplands. The major components of outflow (or discharge) from the aquifer system are discharge to surface water (rivers, agricultural drains, and streams), groundwater pumping, and direct evapotranspiration from groundwater.

Suggested Citation
Bartolino, J. R., 2019, Hydrogeologic framework of the Treasure Valley and surrounding area, Idaho and Oregon [ver. 1.1, January 2020]; U.S. Geological Survey Scientific Investigations Report 2019-5138, 31 p., <https://doi.org/10.3133/sir20195138>.
ISSN: 2328-0328 [online]

Study Area

- ❖ Released on 31Dec2019...
- ❖ Taken down a few days later because of problems with table 3 formatting.
- ❖ Rereleased as **ver.1.1** on 17Jan2020

ScienceBase data release: Main page

The screenshot shows a web browser window with the URL sciencebase.gov. The page title is "Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon". The page content includes:

- Dates:** Publication Date: 2019-01-01, Publication Date: 2020-01-06
- Citation:** Bartolino, J.R., 2020, Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon: U.S. Geological Survey data release, <https://doi.org/10.5066/9B6AC0FG>.
- Summary:** A three-dimensional hydrogeologic framework model (3D HFM) of the westernmost, western Snake River Plain (WSRP) aquifer system was prepared to represent the subsurface distribution and thickness of four hydrogeologic units. The primary source of data for the 3D HFM was lithologic data from a total of 291 well-driller reports. These data were then processed using Rockware (Rockwork) 17 three-dimensional modeling software. The data released here are grouped into three datasets: (1) An ASCII text file of the 3D HFM containing XYZ data, (2) Comma-delimited CSV files containing well information including lithology, (3) An MP4 video file showing the 3D HFM model as it is revealed by slices and then rotated.
- Child Items (3):**
 - Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon: Hydrogeologic Framework Model
 - Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon: Hydrogeologic Framework Model Animation
 - Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon: Well Data
- Contacts:**
 - Point of Contact: James R. Bartolino, Water Resources
 - Originator: James R. Bartolino
 - Metadata Contact: James R. Bartolino
 - Publisher: U.S. Geological Survey
 - Data Owner: Idaho Water Science Center
 - SDC Data Owner: Idaho Water Science Center
 - USGS Mission Area: Water Resources
 - Distributor: U.S. Geological Survey - ScienceBase
- Attached Files (1):**

File Name	Size
TV-HFM_all.jpg "Thumbnail"	47.45 KB
- Spatial Services:** ScienceBase WMS: <https://www.sciencbase.gov/arc>
- Communities:**
 - USGS Data Release Products
 - USGS Idaho Water Science Center
- Tags:**
 - Categories: Data
 - Harvest Set: USGS Science Data Catalog (SDC)
 - Theme: Geology, an information, environment, geoscientific information, geospatial datasets, groundwater, groundwater flow, hydrogeology, hydrology, location, mathematical modeling, natural resource assessment, natural resource exploration, rocks and deposits, scientific interpretation, water resource management, water resources, well drilling
 - Place: Ada County, Boise, Canyon County, Blaine County, Gem County, ID, Idaho, Malheur County, OR, Oregon, Payette County.

ScienceBase data release: 3D HFM

The screenshot shows a web browser window with the ScienceBase website. The page title is "Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; Hydrogeologic Framework Model". The page includes a navigation bar with the USGS logo and "ScienceBase-Catalog" link. The main content area is divided into several sections: "Dates", "Citation", "Summary", "Contacts", "Attached Files", and "Related External Resources". On the right side, there are "Spatial Services" (ScienceBase WMS), "Communities" (USGS Idaho Water Science Center), and "Tags" (Categories: Data, Theme: Geology, animations, environment, geoscientific information, geospatial datasets, groundwater, groundwater flow, hydrology, hydrology, location, mathematical modeling, natural resource assessment, natural resource exploration, rocks and deposits, scientific interpretation, water resource management, water resource, well drilling, Place: Ada County, Boise, Canyon County, Elmore County, Gem County, ID, Idaho, Malheur County, OR, Oregon, Payette County, Snake River Plain, Treasure Valley, USA, Type: Map Service, OGC WFS Layer, OGC WMS Layer, OGC WMS Service). A "Map" button is also visible, leading to a map of the study area.

Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; Hydrogeologic Framework Model

Dates

Publication Date : 2020-01-08
Start Date : 1994-01-01
End Date : 2016-10-10

Citation

Bartolino, J.H., 2020, Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; U.S. Geological Survey data release. <https://doi.org/10.5085/19CA00F6>.

Summary

A three-dimensional hydrogeologic framework model (3D HFM) of the westernmost western Snake River Plain (WSRP) aquifer system was prepared to represent the subsurface distribution and thickness of four hydrogeologic units. The primary source of data for the 3D HFM was lithologic data from a total of 291 well-driller reports. These data were then processed using Rockware Rockworks' 7 three-dimensional modeling software. This dataset is an ASCII text file of the 3D HFM containing XYZ data. It is one of three related datasets.

Contacts

Point of Contact : James R Bartolino, Water Resources
Originator : James R Bartolino
Metadata Contact : James R Bartolino
Publisher : U.S. Geological Survey
Data Owner : Idaho Water Science Center
SDC Data Owner : Idaho Water Science Center
USGS Mission Area : Water Resources
Distributor : U.S. Geological Survey - ScienceBase

Attached Files

Click on title to download individual files attached to this item or [download all files listed below as a compressed file.](#)

File Name	View	Size
TV-HFM_ModelsLamr "Metadata" Original/ FDOC Metadata	View	16.41 KB
TV-HFM_Model_Thumb.jpg "Thumbnail image"	View	47.45 KB
TV-HFM_Model.txt "Data file"	View	29.54 MB

Related External Resources

Spatial Services

ScienceBase WMS : <https://www.sciencebase.gov/ta>

Communities

- USGS Idaho Water Science Center

Tags

Categories : Data

Theme : Geology, animations, environment, geoscientific information, geospatial datasets, groundwater, groundwater flow, hydrology, hydrology, location, mathematical modeling, natural resource assessment, natural resource exploration, rocks and deposits, scientific interpretation, water resource management, water resource, well drilling

Place : Ada County, Boise, Canyon County, Elmore County, Gem County, ID, Idaho, Malheur County, OR, Oregon, Payette County, Snake River Plain, Treasure Valley, USA

Type : Map Service, OGC WFS Layer, OGC WMS Layer, OGC WMS Service

ScienceBase data release: Animation

The screenshot shows a web browser window displaying the ScienceBase website. The page title is "Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; Hydrogeologic Framework Model Animation". The page includes a navigation bar with the USGS logo and "ScienceBase-Catalog" link. The main content area is divided into several sections: "Dates", "Citation", "Summary", "Contacts", "Attached Files", "Spatial Services", "Communities", "Tags", and "Related External Resources".

Dates

Publication Date : 2020-01-08
Start Date : 1994-01-01
End Date : 2016-10-10

Citation

Bartolino, J.H., 2020, Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; U.S. Geological Survey data release. <https://doi.org/10.5085/19CA00F6>.

Summary

A three-dimensional hydrogeologic framework model (3D HFM) of the westernmost western Snake River Plain (WSRP) aquifer system was prepared to represent the subsurface distribution and thickness of four hydrogeologic units. The primary source of data for the 3D HFM was lithologic data from a total of 291 well-driller reports. These data were then processed using Rockware Footworks' 7 three-dimensional modeling software. This dataset consists of a MP4 video file showing the 3D HFM model as it is revealed by slices and then rotated. It is one of three related datasets.

Contacts

Point of Contact : James R Bartolino, Water Resources
Originator : James R Bartolino
Metadata Contact : James R Bartolino
Publisher : U.S. Geological Survey
Data Owner : Idaho Water Science Center
SDC Data Owner : Idaho Water Science Center
USGS Mission Area : Water Resources
Distributor : U.S. Geological Survey - ScienceBase

Attached Files

File Name	View	Size
TV-HFM_Anim.mxd "Metadata" Original/ FDOC Metadata	View	16.03 KB
TV-HFM_Anim_Thumb.jpg "Thumbnail"		189.64 KB
TV-HFM_Anim.mp4 "MP4 3D HFM animation"		122.72 MB

Spatial Services

ScienceBase WMS : <https://www.sciencebase.gov/>

Communities

- USGS Idaho Water Science Center

Tags

Categories : Data
Theme : Geology, animations, environment, geoscientific information, geospatial datasets, groundwater, groundwater flow, hydrology, hydrology, location, mathematical modeling, natural resource assessment, natural resource exploration, rocks and deposits, scientific interpretation, water resource management, water resource, well drilling
Place : Ada County, Boise, Canyon County, Elmore County, Gem County, ID, Idaho, Malheur County, OR, Oregon, Payette County, Snake River Plain, Treasure Valley, USA
Type : Map Service, OGC WFS Layer, OGC WMS Layer, OGC WMS Service

ScienceBase data release: Well data

The screenshot shows the ScienceBase website interface. At the top, there's a navigation bar with the USGS logo and 'ScienceBase-Catalog'. The main content area is titled 'Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; Well Data'. It includes sections for 'Dates', 'Citation', 'Summary', 'Contacts', 'Attached Files', and 'Spatial Services'. The 'Attached Files' section contains a table with three entries: 'Metadata' (27.62 KB), 'Thumbnail' (401.21 KB), and 'Data file' (157.73 KB). The 'Spatial Services' section includes a 'ScienceBase WMS' link and a 'Map' button. The 'Communities' section lists 'USGS Idaho Water Science Center' and the 'Tags' section includes 'Data' and various scientific terms.

ScienceBase Catalog → USGS Idaho Water Science... → Hydrogeologic Framework... → Hydrogeologic Framework...

Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon; Well Data

[View](#)

Dates

Publication Date : 2020-01-06
Start Date : 1924-01-01
End Date : 2018-10-19

Citation

Bartolino, J.R., 2020. Hydrogeologic Framework of the Treasure Valley and Surrounding Area, Idaho and Oregon. U.S. Geological Survey data release, <https://doi.org/10.5068/99CACDF6>.

Summary

A three-dimensional hydrogeologic framework model (3D-HFM) of the westernmost western Snake River Plain (WSRP) aquifer system was prepared to represent the subsurface distribution and thickness of four hydrogeologic units. The primary source of data for the 3D-HFM was lithologic data from a total of 391 well-driller reports. These data were then processed using Rockware Rockworks 17 three-dimensional modeling software. This dataset consists of five comma-delimited CSV files containing well information: location, lithology, well construction, aquifer, and comments. It is one of three related datasets.

Contacts

Point of Contact : [James R Bartolino, Water Resources](#)
Originator : [James R Bartolino](#)
Metadata Contact : [James R Bartolino](#)
Publisher : [U.S. Geological Survey](#)
Data Owner : [Idaho Water Science Center](#)
SDC Data Owner : [Idaho Water Science Center](#)
USGS Mission Area : [Water Resources](#)
Distributor : [U.S. Geological Survey - ScienceBase](#)

Attached Files

Click on title to download individual files attached to this item or [download all files](#) listed below as a compressed file.

File Name	View	Size
TV-HFM_Wells.csv "Metadata" Original FGSC Metadata	View	27.62 KB
TV-HFM_Wells_Thumb.jpg "Thumbnail"		401.21 KB
TV-HFM_Wells.zip "Data file"		157.73 KB

Spatial Services

ScienceBase WMS : <https://www.sciencebase.gov/catalog>

Communities

[USGS Idaho Water Science Center](#)

Tags

Categories : [Data](#)
Theme : [Geology](#), [animations](#), [environment](#), [geoscientific information](#), [geospatial datasets](#), [groundwater](#), [groundwater flow](#), [hydrogeology](#), [hydrology](#), [location](#), [mathematical modeling](#), [remote sensing assessment](#), [satellite imagery](#)

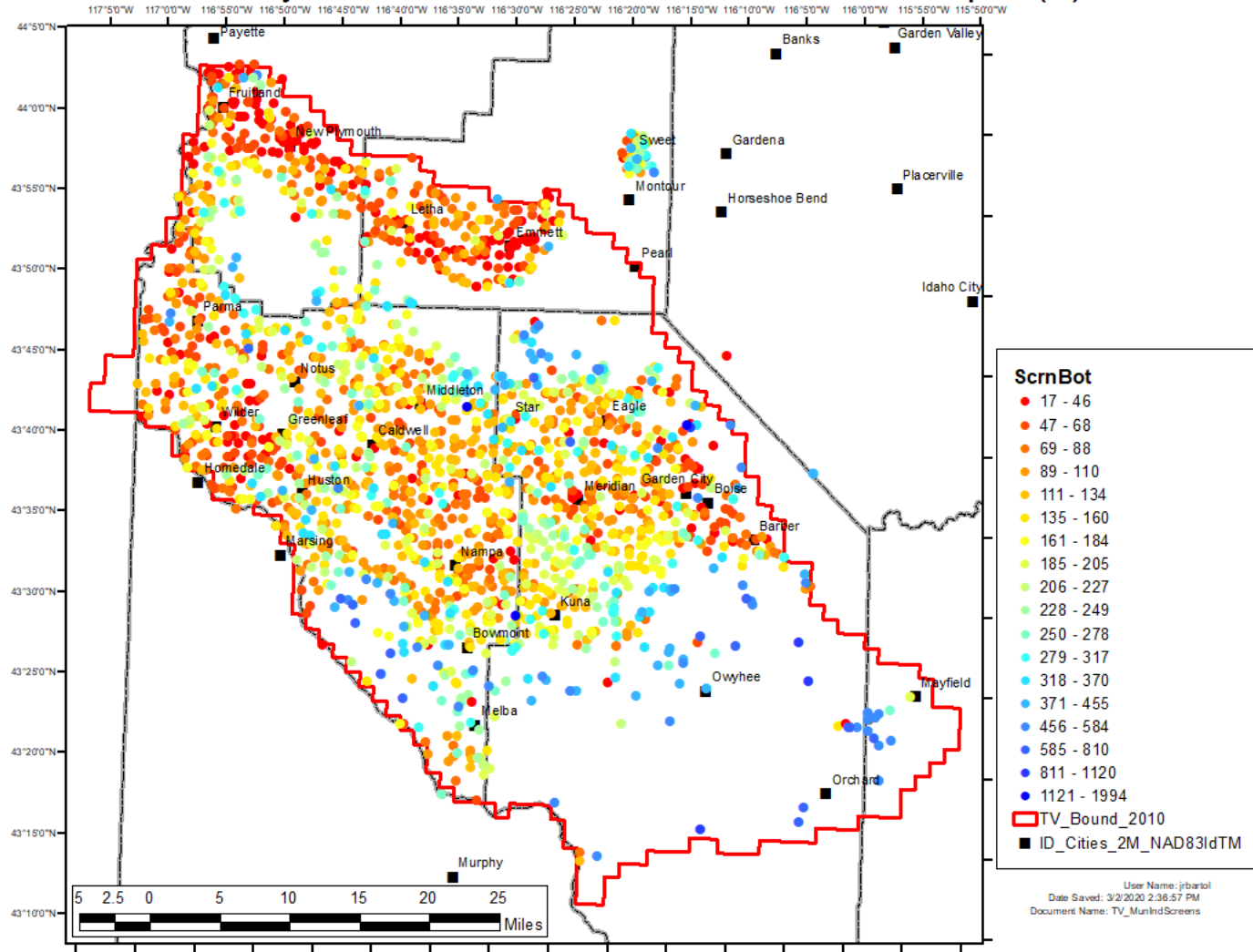
Related External Resources

GROUNDWATER PODS

POD Wells: Domestic (1)

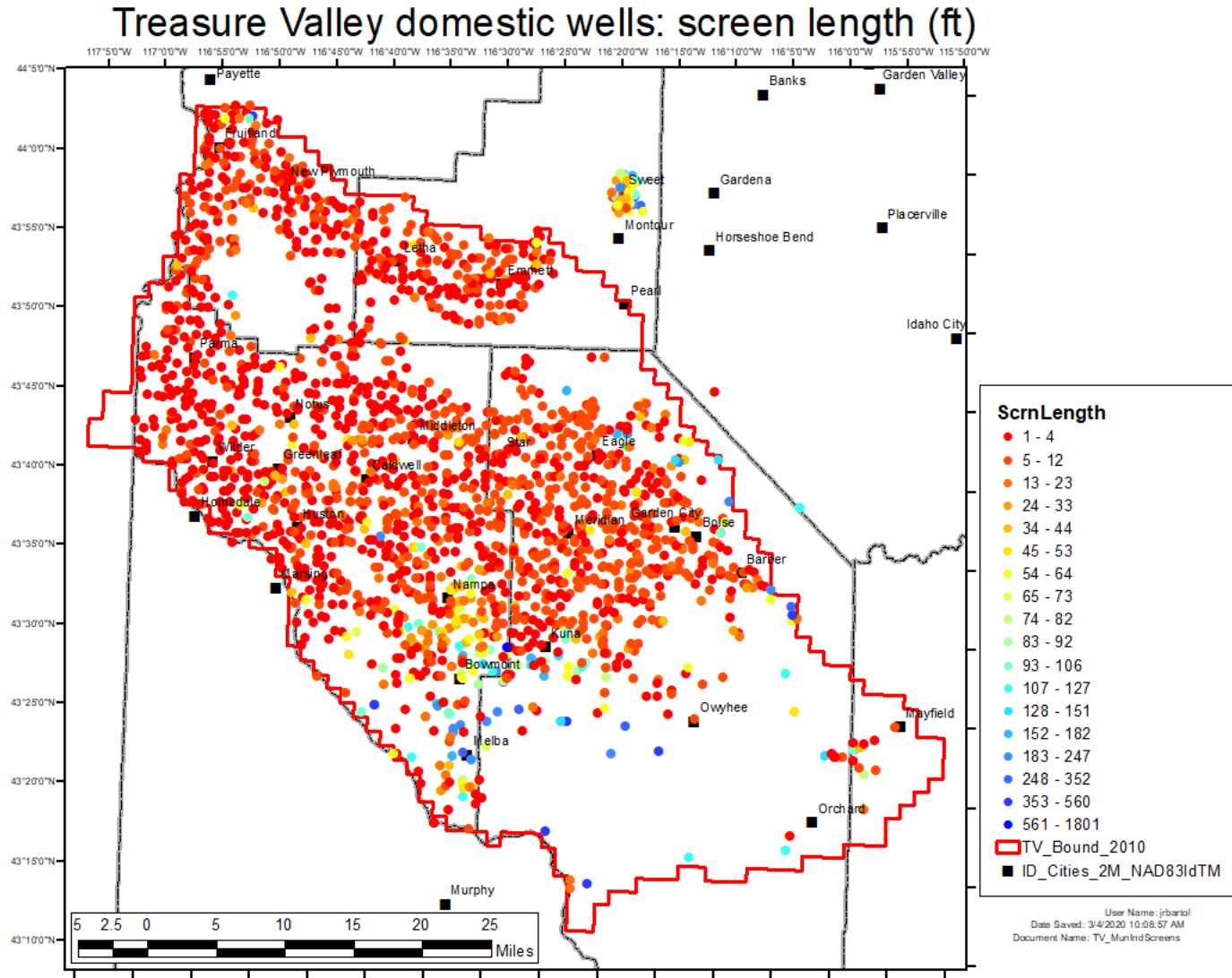
- ❖ Difficult to match water rights to wells; entered screen intervals for two wells per section for uniform coverage
- ❖ 2,120 wells
- ❖ Screen bottoms 17-1994 ft; average 157 ft

Treasure Valley domestic wells: bottom of screen, depth (ft)



POD Wells: Domestic (2)

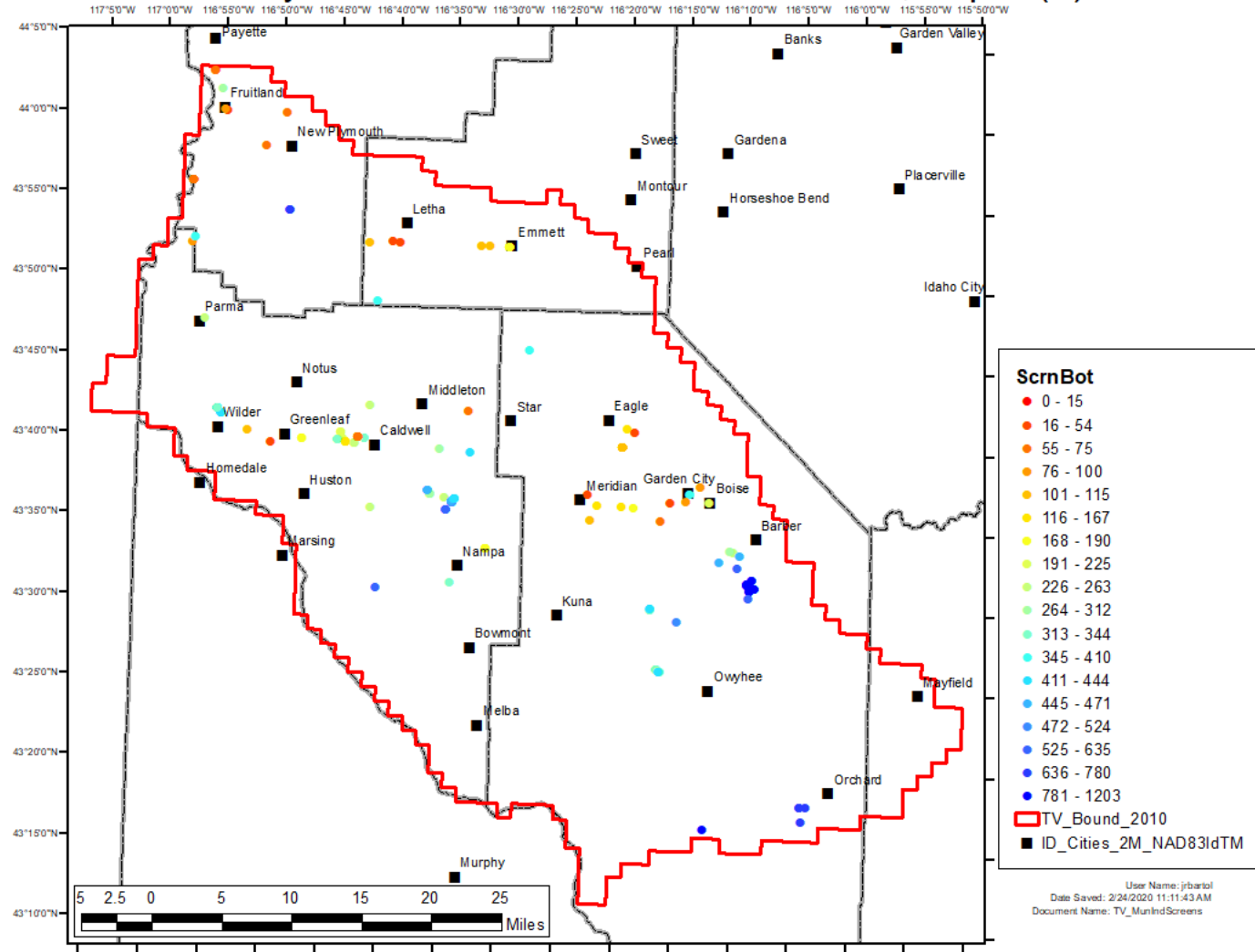
- ❖ Difficult to match water rights to wells; entered screen intervals for two wells per section for uniform coverage
- ❖ 2,120 wells
- ❖ Screen lengths 1-1801 ft; average 19 ft



POD Wells: Industrial (1)

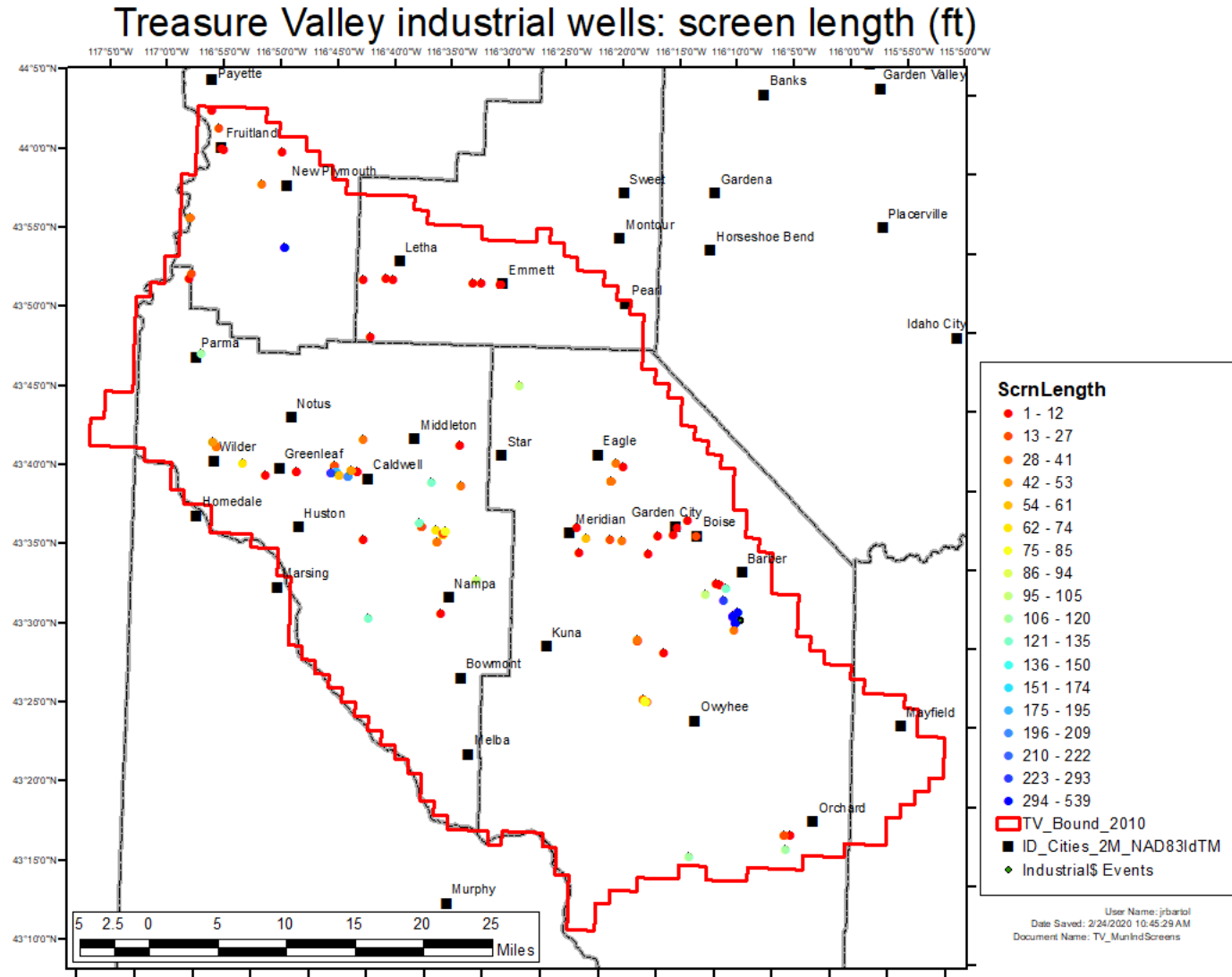
- ❖ Matched 194 water rights to wells; entered screen intervals
- ❖ Many of these wells are essentially domestic/commercial wells (office, store, etc)
- ❖ Screen bottoms 15-1203 ft; average 362 ft

Treasure Valley industrial wells: bottom of screen, depth (ft)



POD Wells: Industrial (2)

- ❖ Matched 194 water rights to wells; entered screen intervals
- ❖ Many of these wells are essentially domestic/commercial wells (office, store, etc)
- ❖ Screen lengths 1-573 ft; average 88 ft



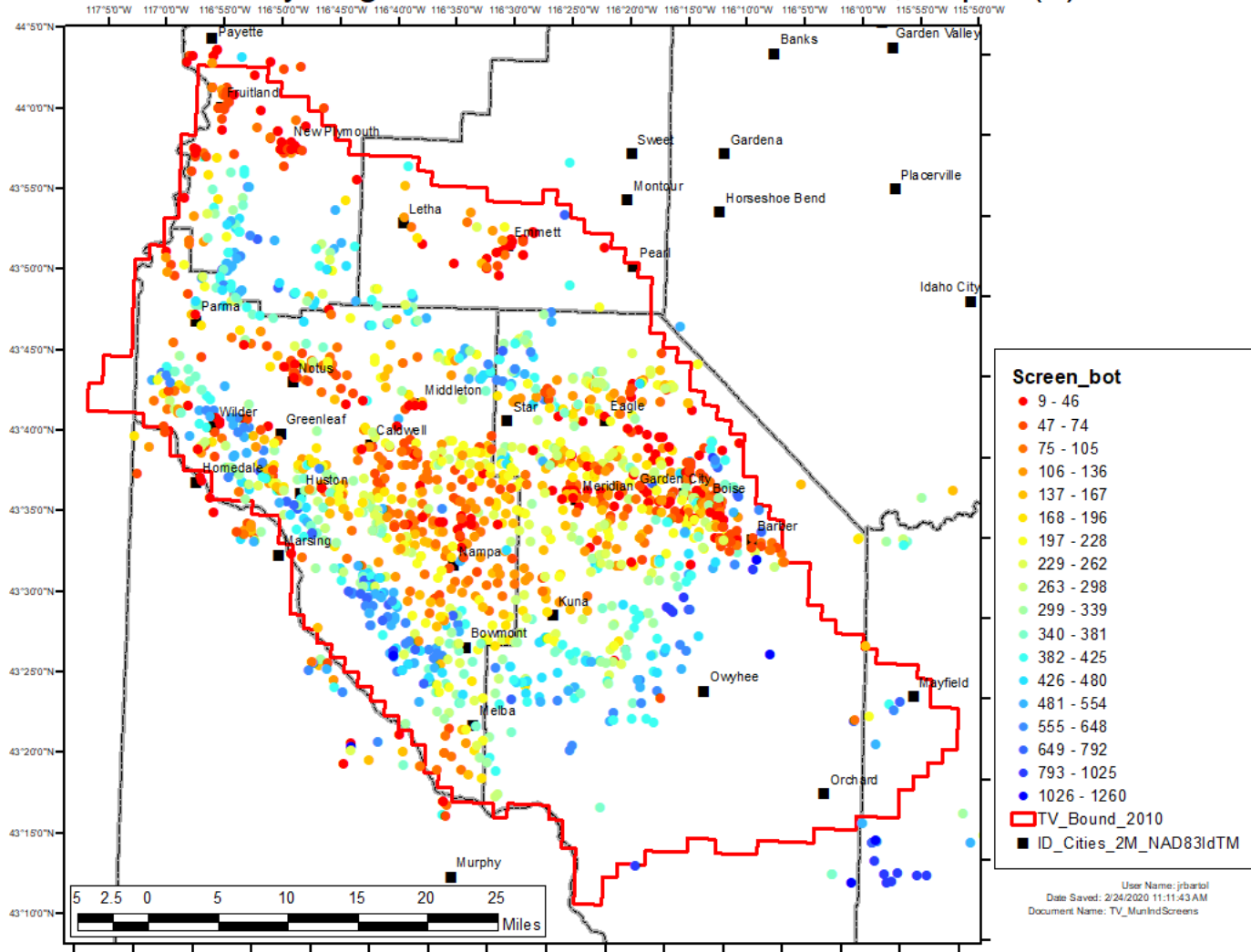
POD Wells: Irrigation (1)

- ❖ Difficult to match water rights to wells; entered screen intervals for two wells per section

- ❖ 1,698 wells

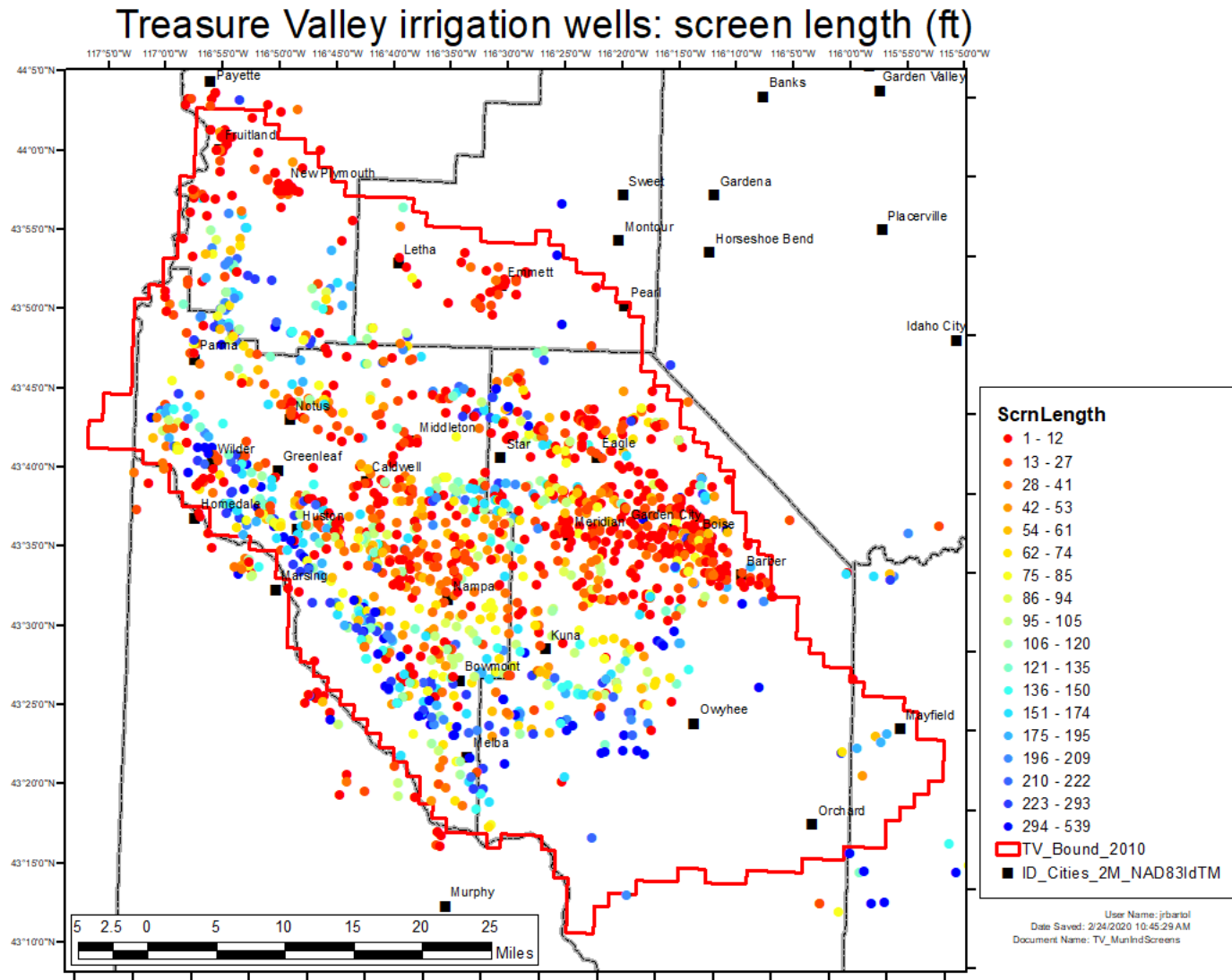
- ❖ Screen bottoms 9-1260 ft; average 250 ft

Treasure Valley irrigation wells: bottom of screen, depth (ft)



POD Wells: Irrigation (2)

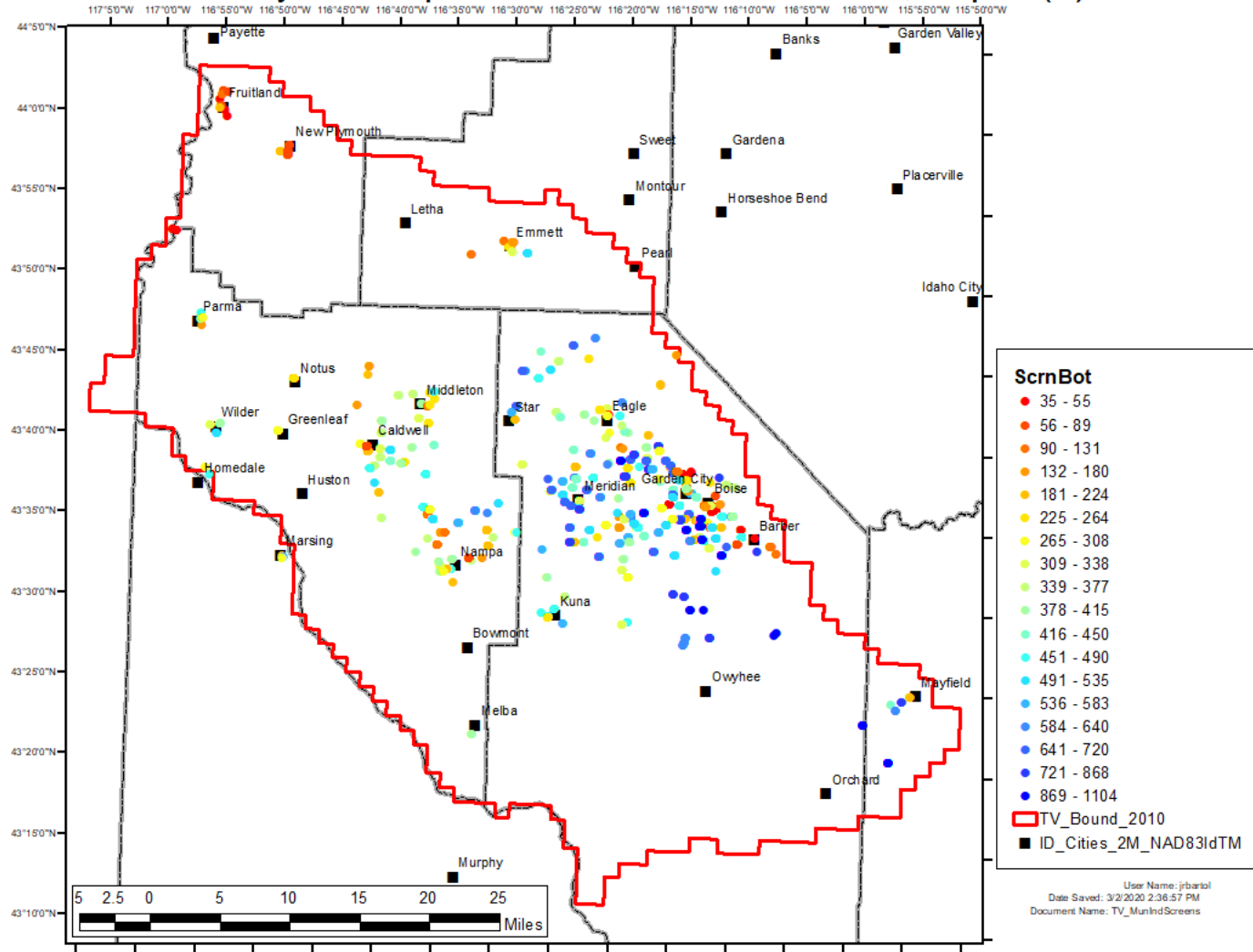
- ❖ Difficult to match water rights to wells; entered screen intervals for two wells per section
- ❖ 1,698 wells
- ❖ Screen lengths 1-870 ft; average 88 ft



POD Wells: Municipal (1)

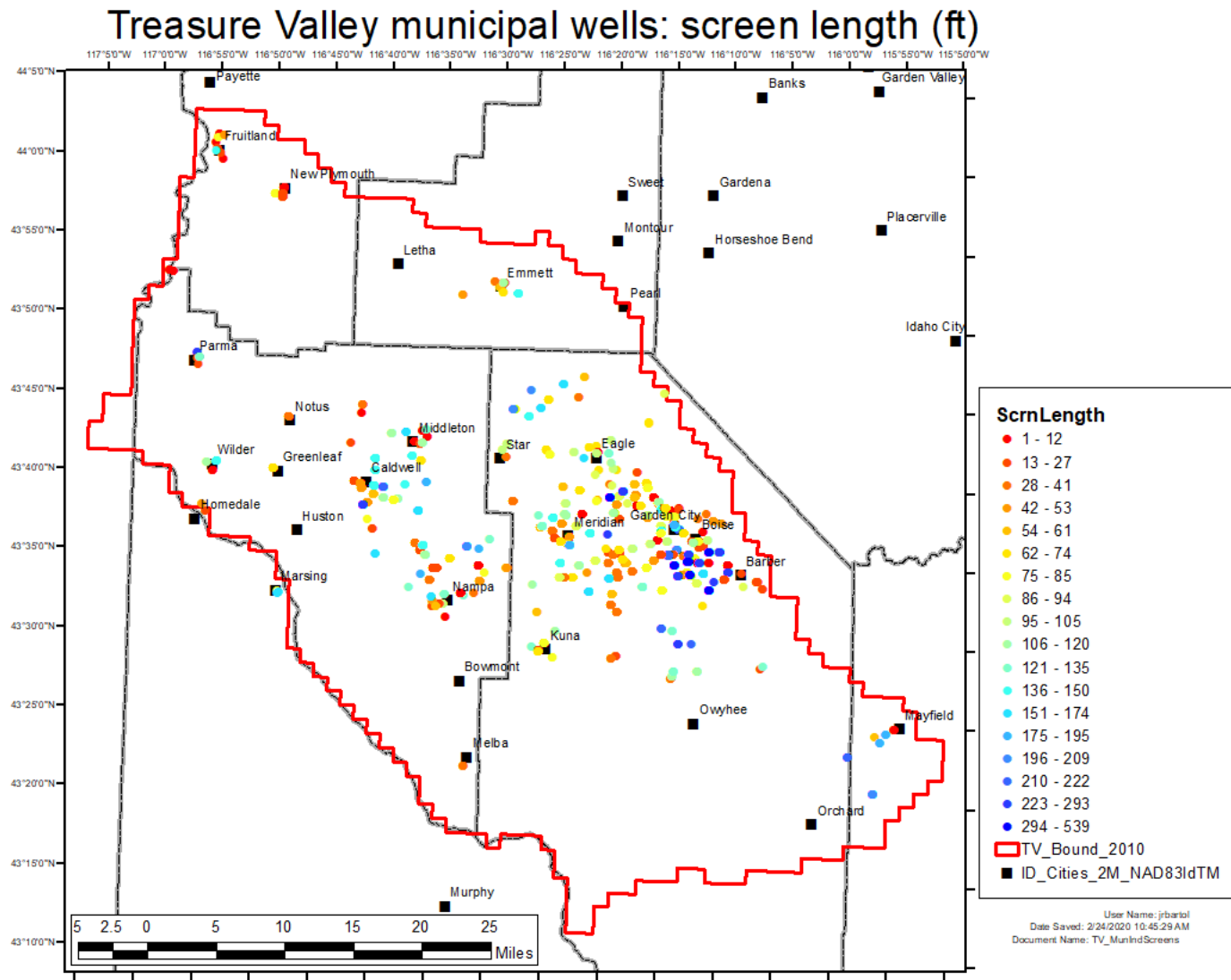
- ❖ Matched 4,976 water rights to wells; entered screen intervals
- ❖ Water rights may be transferred to younger wells
- ❖ A well may have multiple water rights and vice versa
- ❖ Screen bottoms 35-1104 ft; average 438 ft

Treasure Valley municipal wells: bottom of screen, depth (ft)



POD Wells: Municipal (2)

- ❖ Matched 4,976 water rights to wells; entered screen intervals
- ❖ Water rights may be transferred to younger wells
- ❖ Screen lengths 1-539 ft; average 102 ft



❖ Report:

<https://doi.org/10.3133/sir20195138>

❖ Data:

<https://doi.org/10.5066/P9CAC0F6>

