Hydrogeologic framework, Treasure Valley, Idaho: update

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Drilling of IWSC09
USGS IdWSC
14Mar11

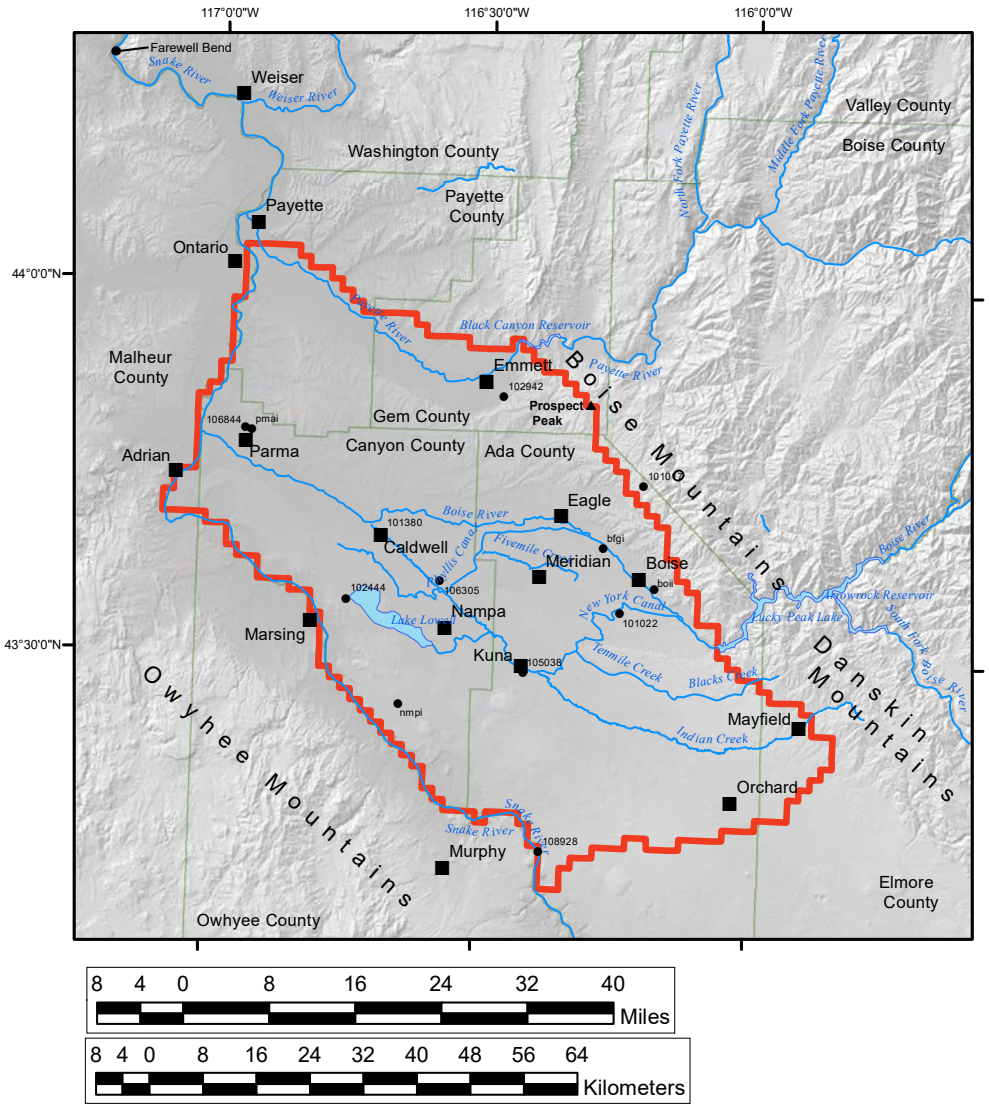
Status

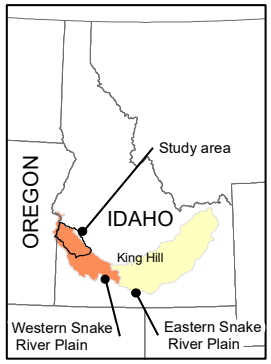
- The hydrogeologic framework report is in review.
- Finally.
- 34 p. of text, 6 figs, 6 tables, and 21 p. of references.
- There will be a separate data release of the 3D hydrogeologic framework model (3D HFM).
- The report and data release should be out by Thanksgiving.

Hydrogeologic units

- Four units based on lithology/depositional environment
  - Coarse-grained fluvial and alluvial deposits: sand and gravel
  - Fine-grained lacustrine deposits: silt and clay
  - Pliocene-Pleistocene and Miocene basalts: basalt and scoria, includes Columbia River Basalt
  - Rhyolitic and granitic basement: rhyolite, Idaho batholith granite

Figure 1.--Map showing locations of communities,weather stations, and other features, western Snake River Plain, southwestern Idaho





Explanation

- Weather station
- Fivemile Creek
- Johnson (2013) model extent
- Counties

Coordinate System: NAD 1983 Idaho TM
Projection: Transverse Mercator
Datum: North American 1983
False Easting: 2,500,000.0000
False Northing: 1,200,000.0000
Central Meridian: -114.0000
Scale Factor: 0.9996
Latitude Of Origin: 42.0000
Units: Meter

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Figure 2.-- Graph showing Palmer drought severity index for Idaho climate zone 5 (Southwestern Valleys).

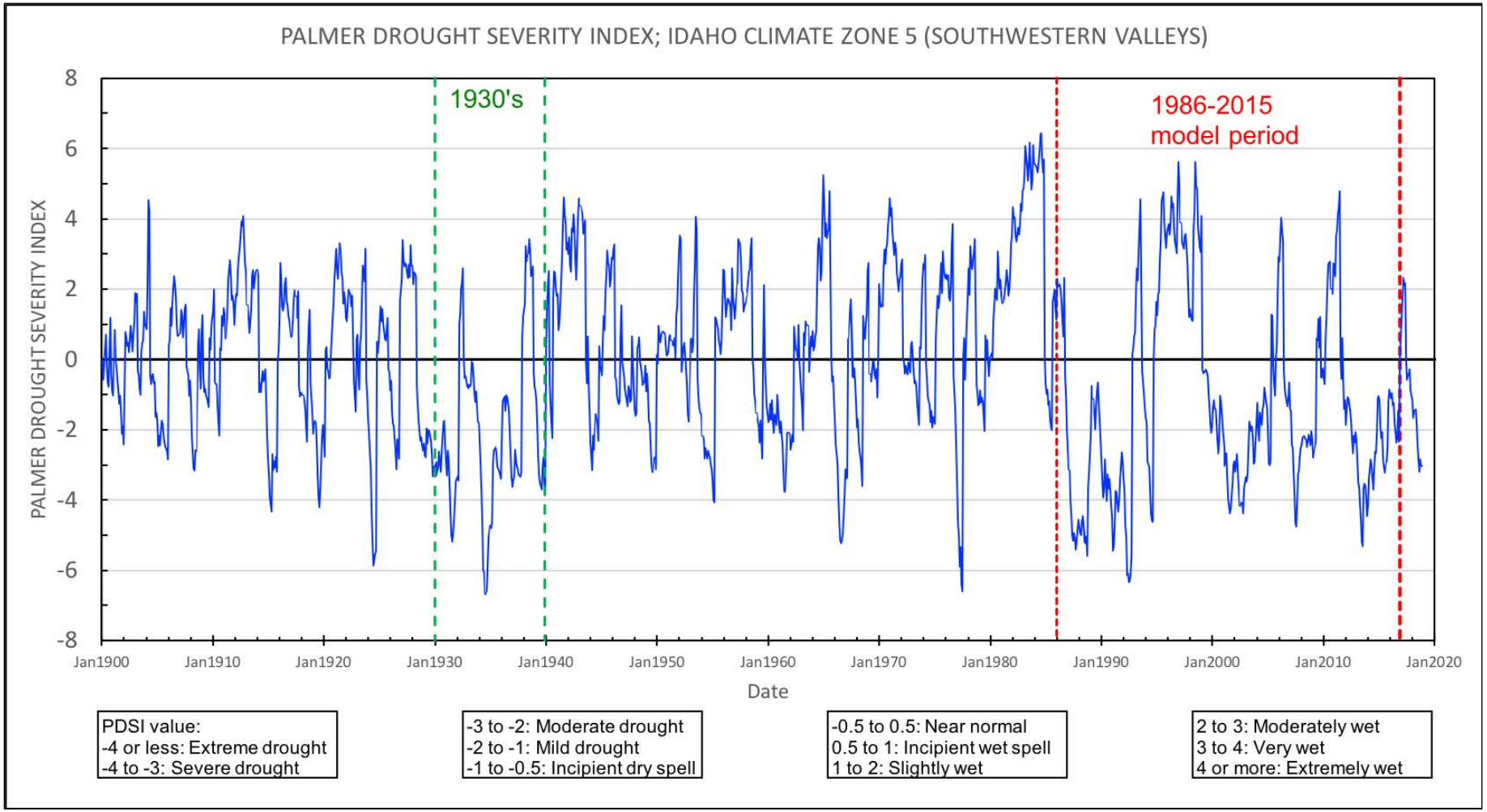

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Figure 3.--Map showing boundaries of selected groundwater models, western Snake River Plain, southwestern Idaho

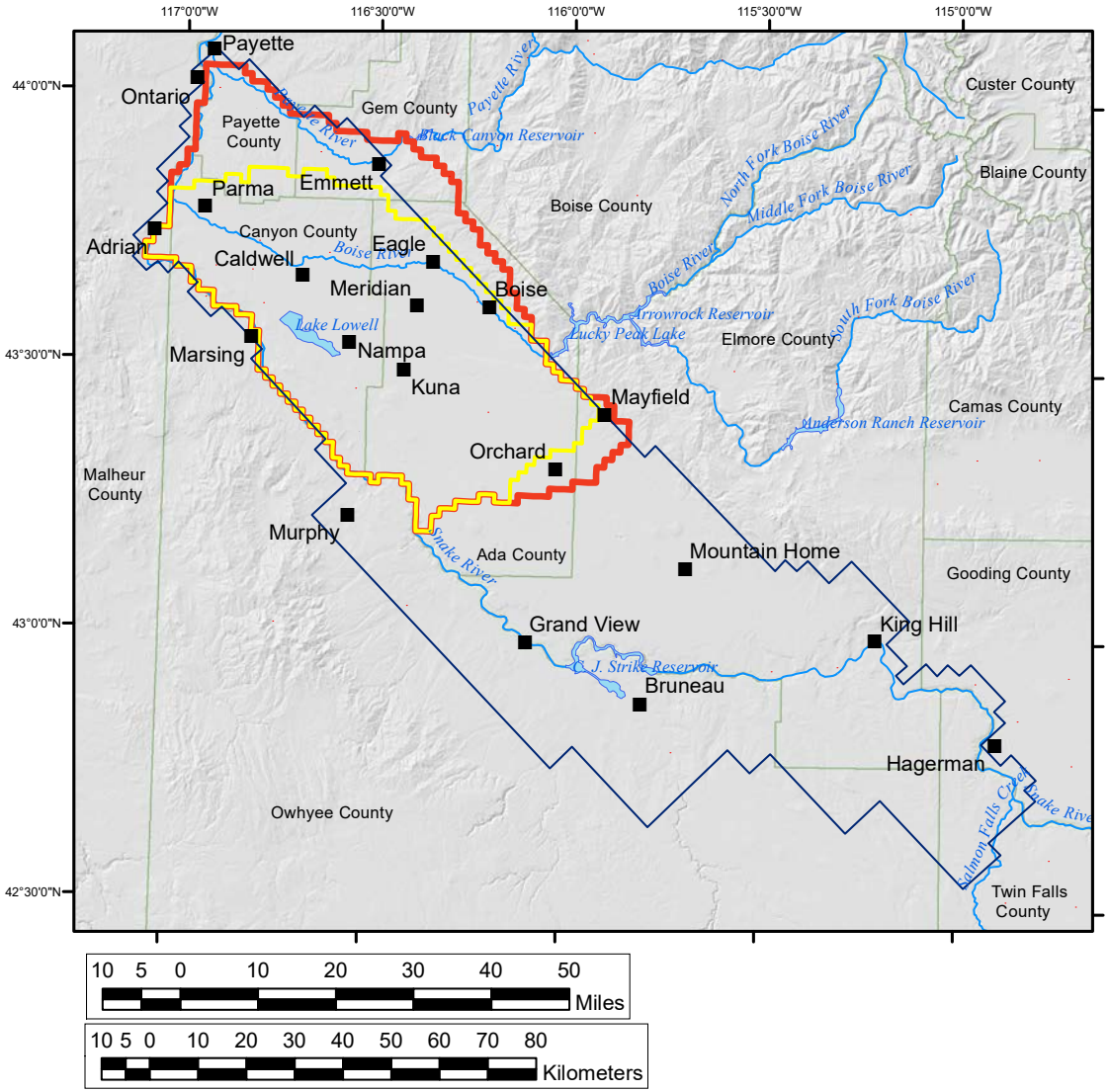

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Figure 4.--Map showing wells used to generate the three-dimensional hydrogeologic framework model, western Snake River Plain, southwestern Idaho

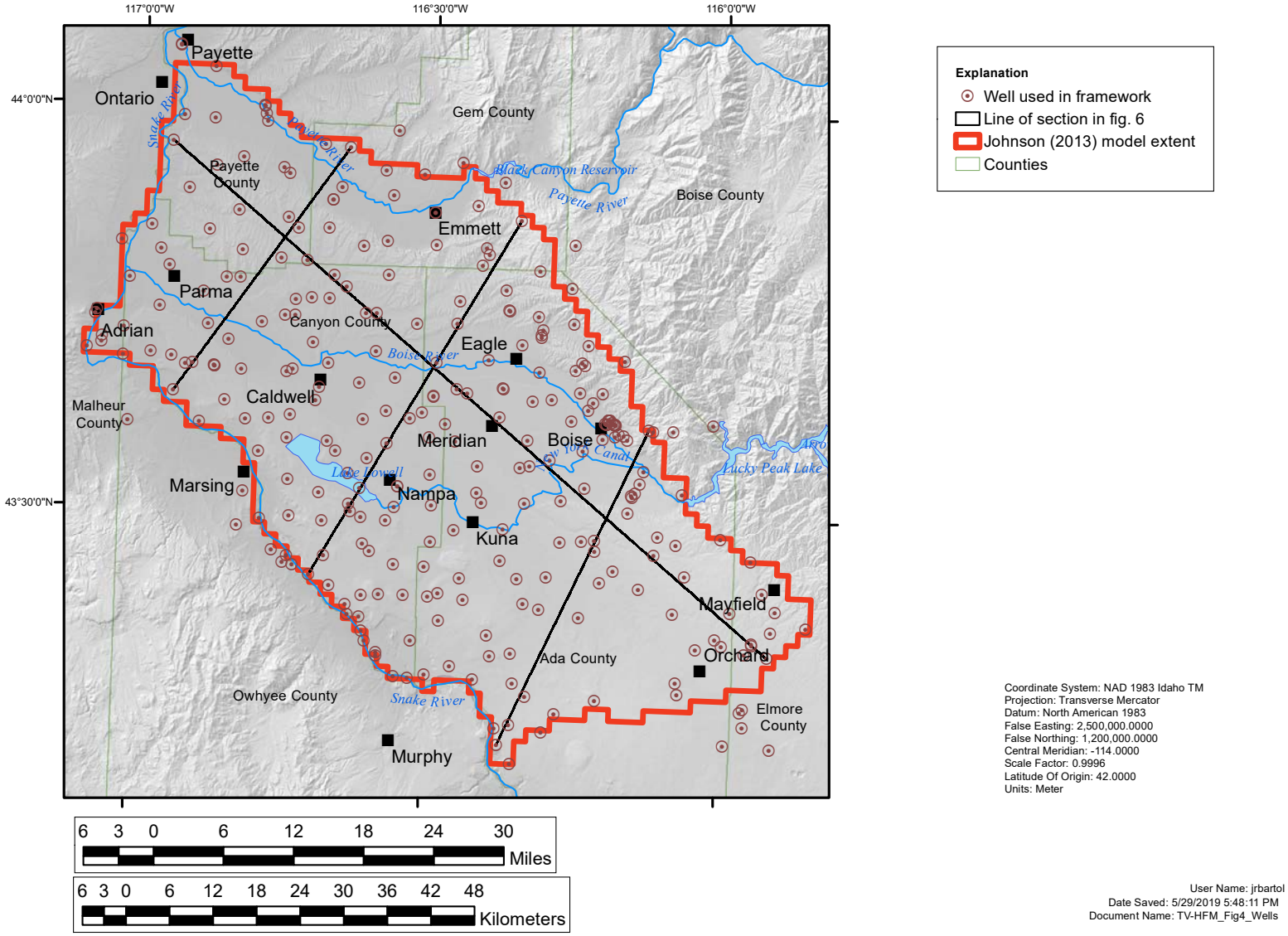

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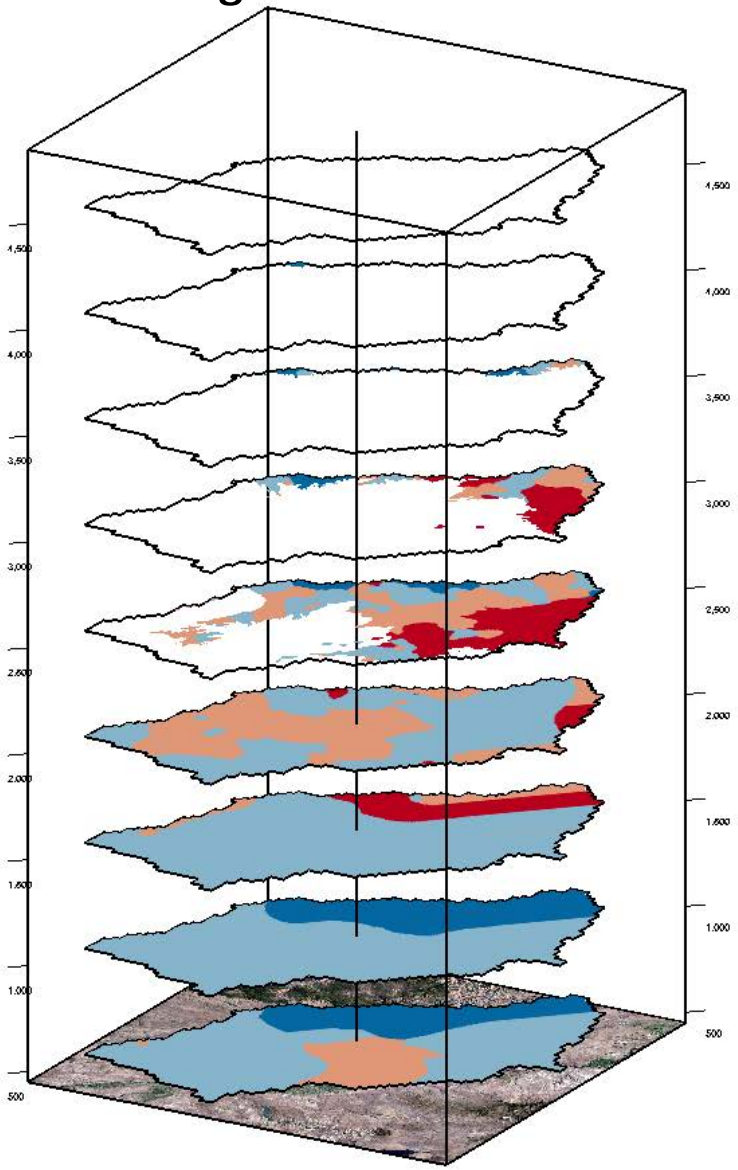
Figure 5. Perspective view of horizontal slices at 500-ft intervals through the three-dimensional hydrogeologic framework model



Explanation

- Coarse-grained fluvial and alluvial deposits
- Basalt, undifferentiated: includes Pliocene-Pleistocene and Miocene basalts
- Fine-grained lacustrine deposits
- Granitic and rhyolitic bedrock

View is from the southwest looking to the northeast from an elevation of 20 degrees above the horizon. Vertical exaggeration is 50 times. Horizontal and vertical scale is variable owing to the effects of perspective view. Colors may appear variable owing to the effects of illumination from above and southeast.

GE imagery date: 12/30/2016
(? It's pretty green for Dec)
Extent of GE image:
Top: 1,463,484 m
Bottom: 1,311,364 m
East: 2,372,439 m
West: 2,221,494 m
Base: 500 ft / Top: 4,500 ft
Colors are colorblind safe from Colorbrewer,
RGB: Basalt 202,0,32; Coarse 244,165,130;
Fine 146,197,222; BRK 5,113,176
View: 240/20 degrees, 50X VE

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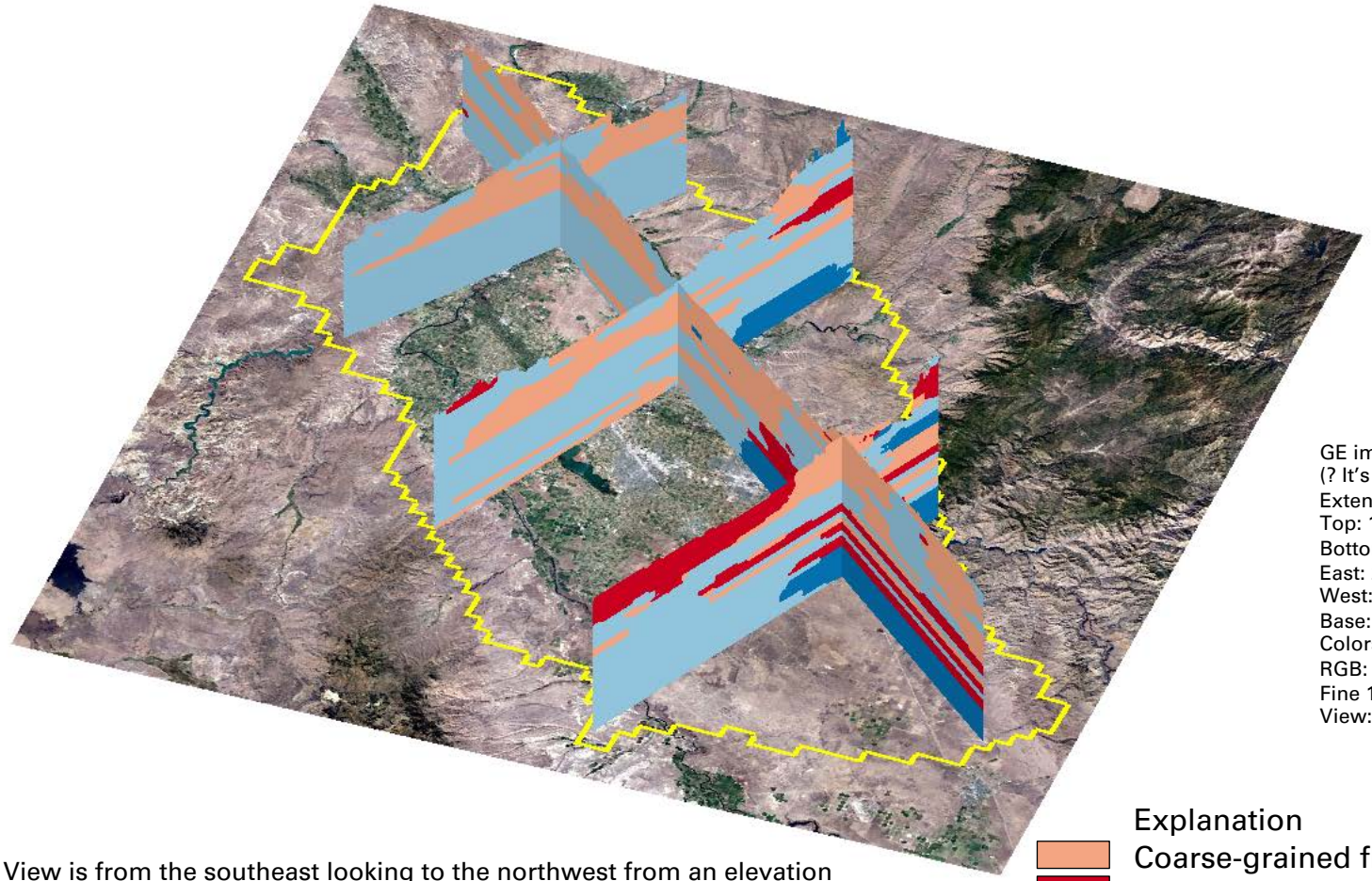
Figure 6. Perspective view of vertical cross sections of the three-dimensional hydrogeologic framework model



GE imagery date: 12/30/2016
(? It's pretty green for Dec)
Extent of GE image:
Top: 1,463,484 m
Bottom: 1,311,364 m
East: 2,372,439 m
West: 2,221,494 m
Base: 500 ft / Top: 4,800 ft
Colors are colorblind safe from Colorbrewer,
RGB: Basalt 202,0,32; Coarse 244,165,130;
Fine 146,197,222; BRK 5,113,176
View: 160/40 degrees 7X

View is from the southeast looking to the northwest from an elevation of 40 degrees above the horizon. Vertical exaggeration is 5 times. Horizontal and vertical scale is variable owing to the effects of perspective view. Colors appear variable owing to the effects of illumination from above and southeast. Lines of section are shown on figure 4.

Explanation

- Coarse-grained fluvial and alluvial deposits
- Basalt, undifferentiated: includes Pliocene-Pleistocene and Miocene basalts
- Fine-grained lacustrine deposits
- Granitic and rhyolitic bedrock

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Geologic time scale and history

Geologic time			Geologic history
Era	Period	Series	
Cenozoic (66 Ma to present)	Quaternary (2.6 Ma to Present)	Holocene (11,700 y to present)	Current landscape
		Pleistocene (2.6 Ma to 11,700 y)	Bonneville flood (15-14.5 ka) Deposition of Tenmile gravels on dry bed of Lake Idaho (1.7-1.6 Ma) Lake Idaho overflows into the Columbia drainage and begins draining (~2-1.7 Ma)
	Tertiary (66 to 2.6 Ma)	Pliocene (5.3 to 2.6 Ma)	Resumption of basalt volcanism (2.2-0.1 Ma) Lake Idaho forms (4 Ma) Unconformity
		Miocene (23 to 5.3 Ma)	Chalk Hills Lake drains (~6-5 Ma) Chalk Hills Lake forms (~10-8 Ma) Main episode of WSRP faulting (11-9 Ma) Eruption of Jump Creek rhyolite (11.7-10.6 Ma) OR-ID graben and Weiser embayment form; deposition of Sucker Crk Fm (~15.5 Ma) Eruption of Lower Columbia River Basalts (16.9-15.6 Ma)
		Oligocene (34 to 23 Ma)	
		Eocene (56 to 34 Ma)	
		Paleocene (66 to 56 Ma)	
Mesozoic (251 to 66 Ma)	Cretaceous (~145 to 66 Ma)	Upper/Late (100 to 66 Ma)	Intrusion of Idaho Batholith into older rocks (95-75 Ma)
		Lower/Early (~145 to 100 Ma)	

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Data release

- Rockworks 17
  - Proprietary: SQLite database plus various model and graphics files (.RwGrd, .Rw2D, .Rw3D, .RwMod)
  - Can export data to .txt, .dbf, .mdb, or .xlsx
  - Can export graphics to standard image formats (including videos) but can't manipulate views of model
  - Can export slices or surfaces to shapefiles or .kml
- Other 3D HFM data releases
  - Rio Grande: Rockworks17 -> shapefiles and geodatabases
  - Santa Cruz (AZ): EarthVision -> Earthvision proprietary files, .txt, GeoTIFFs, video, EarthVision DemoViewer
- Proposed
  - RW17, .txt and .xlsx, shapefiles, and graphic and video files