ISGS Earth Systems Visualization Laboratory:
A 3-D Visualization Resource at the University of Illinois

Donald A. Keefer

Prairie Research Institute

University of Illinois at Urbana Champaign

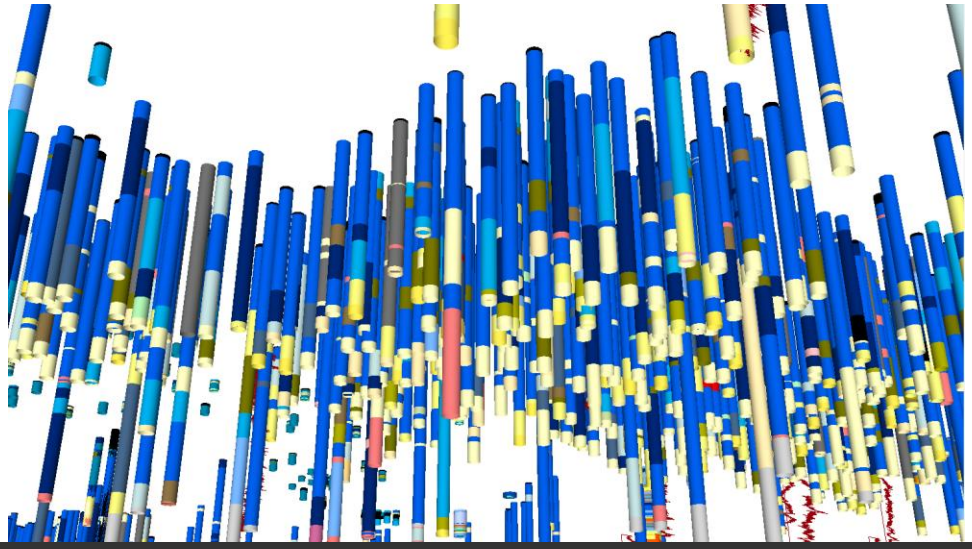
ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

Earth Systems Visualization Laboratory

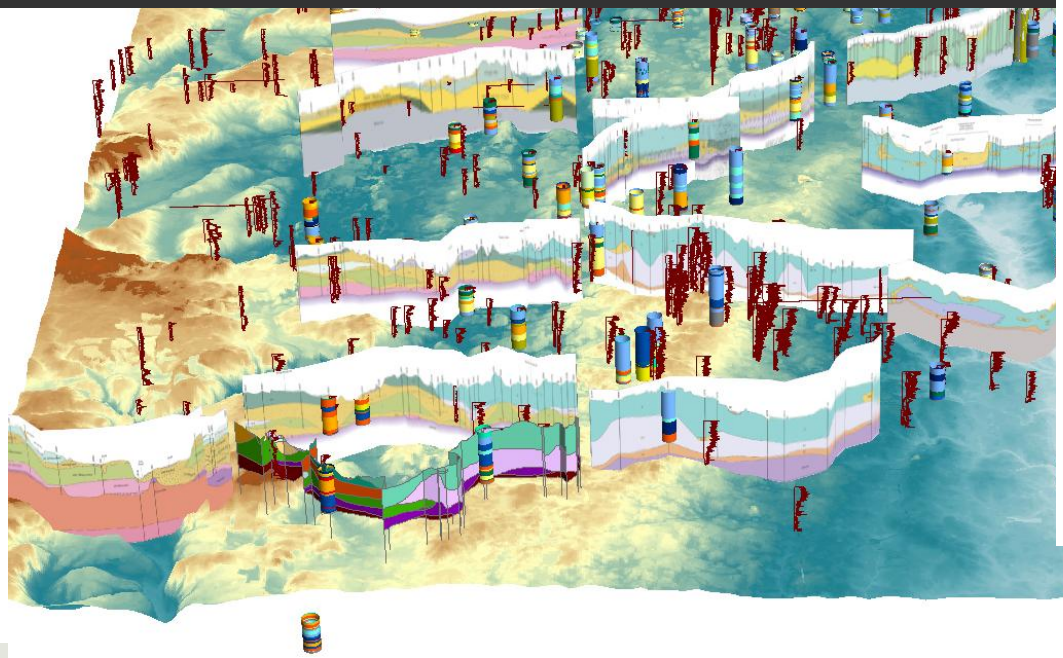
- Advanced imaging and analysis tools and expertise, targeted to earth science research
- Collaborative, 3-D immersion workspace
- Focal point for development of new research, tools and techniques

Current Commercial Software

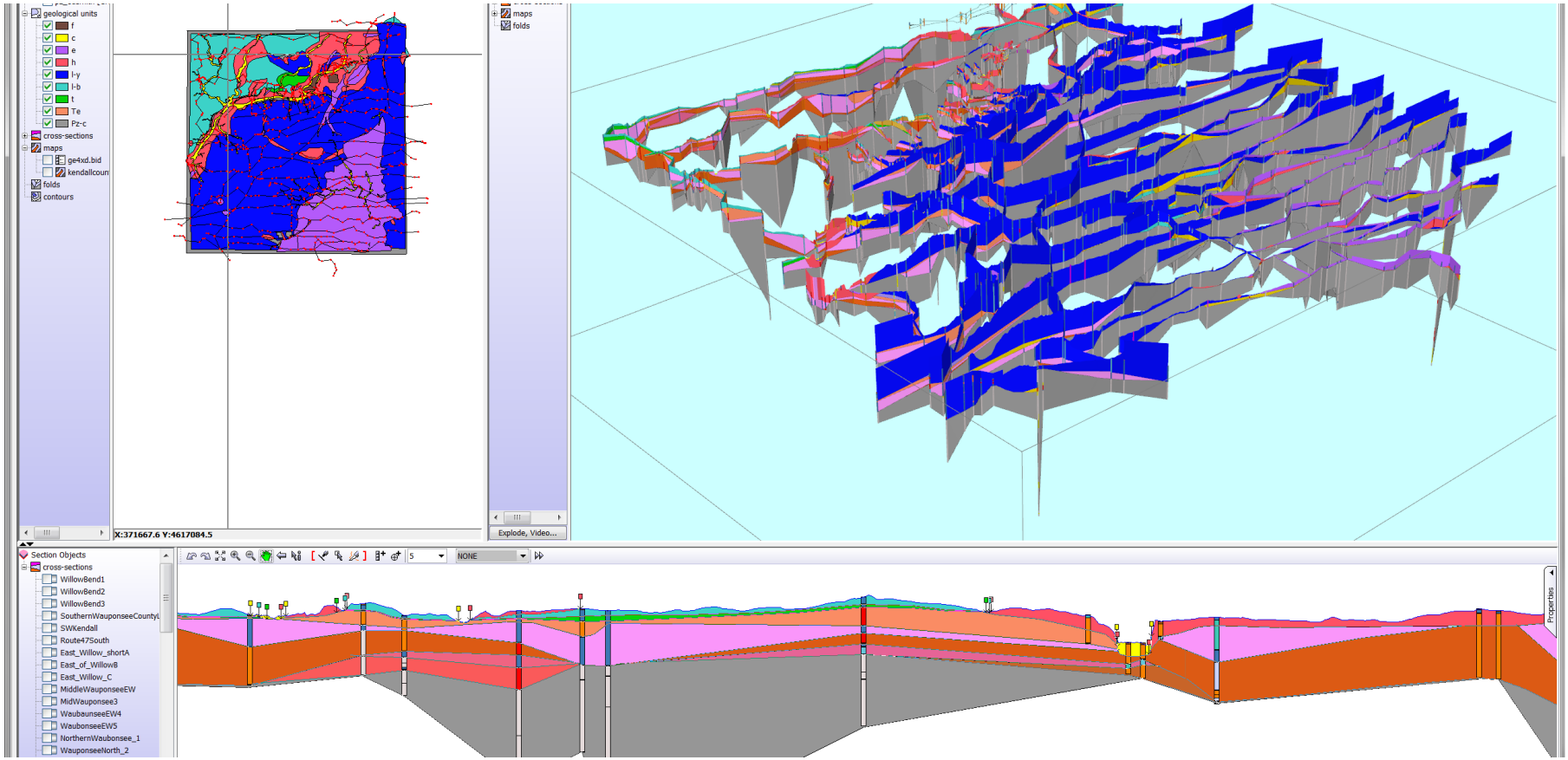
- GeoVisionary
- ArcGIS
- GSI3D
- ParaView
- Surfer
- Rockworks
- Mathematica
- MaPublisher
- Adobe CS4
- Geographic Imager
- Imagine
- MARS Explorer
- Isatis
- …



GeoVisionary & ArcScene

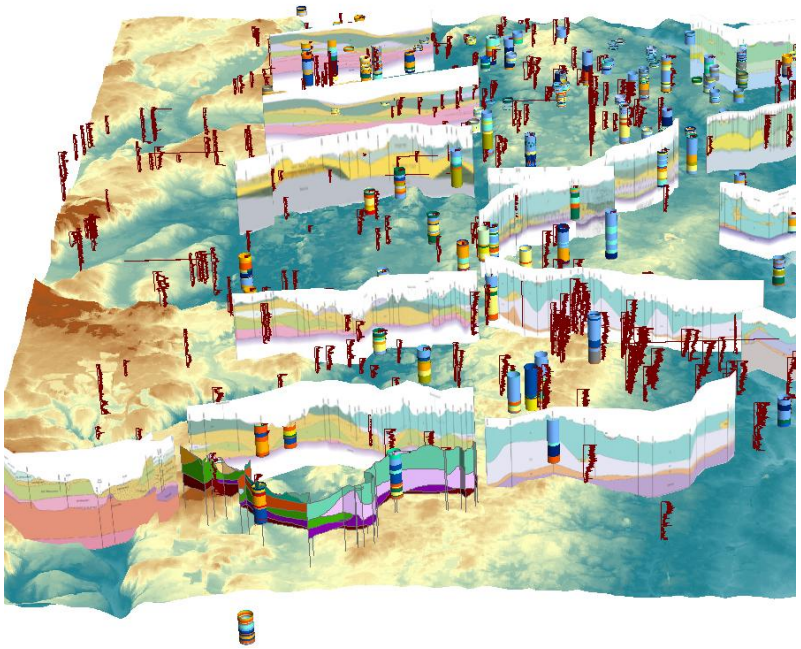


GSI3D

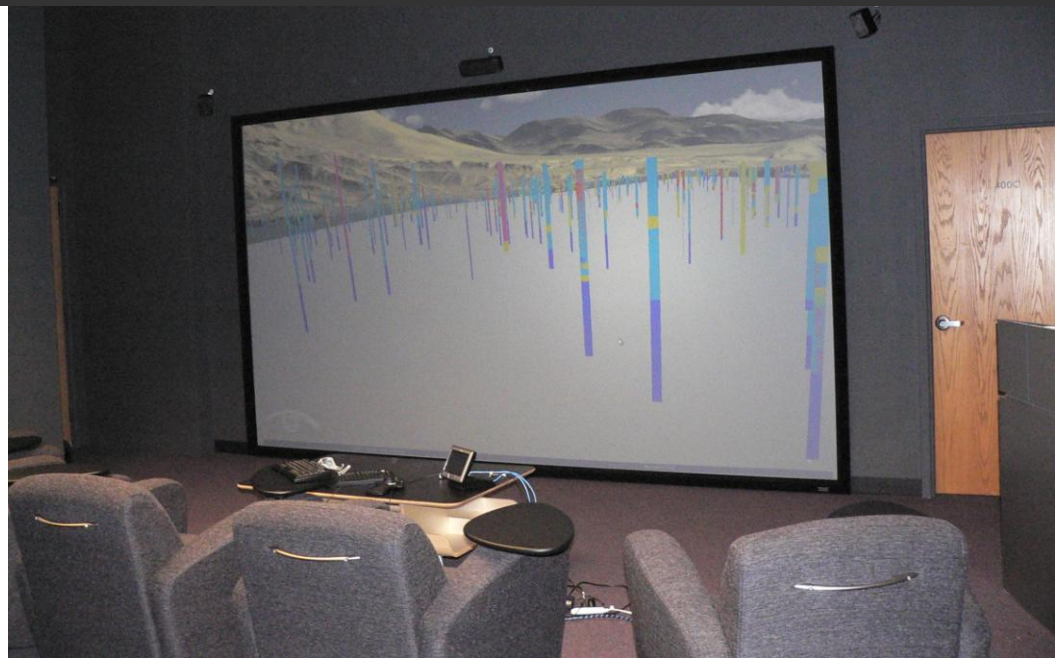

geological units
f
c
e
h
l-y
l-b
t
Te
Pz-c
cross-sections
maps
ge4xd.bid
kendallcoun
folds
contours
maps
folds
X:371667.6 Y:4617084.5
Explode, Video...
Section Objects
cross-sections
WillowBend1
WillowBend2
WillowBend3
SouthernWauponseeCountyL
SWKendall
Route47South
East_Willow_shortA
East_of_WillowB
East_Willow_C
MiddleWauponseeEW
MidWauponsee3
WaubaunseeEW4
WaubonseeEW5
NorthernWaubonsee_1
WauponseeNorth_2
NONE
Properties

Custom Software and Tools

- ArcScene, ArcMap tools for 3-D geologic mapping support
- MFV (MODFLOW Viewer): visualization and analysis of flow paths from MODFLOW/MODPATH
- RVA (Reservoir Visualization and Analysis): advanced visualization, data analysis and data mining for unconventional oil and gas resources
- GSI3D support scripts



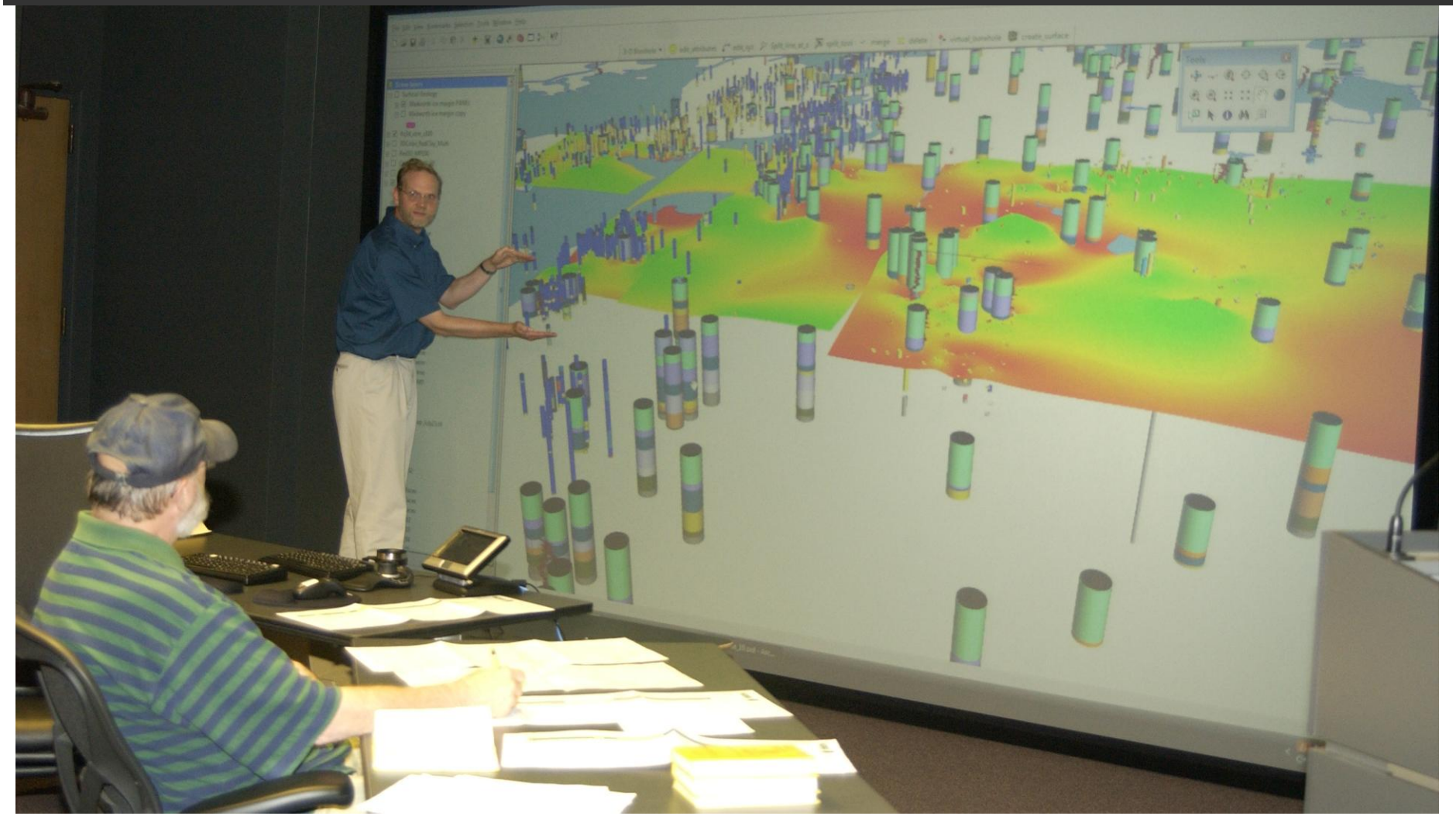
ESVL Facilities



- Custom 2-room suite on 4th floor, Natural Resources Building
- 14'x8' back projected screen
- High-resolution projector
- Active stereo capabilities
- Flexible working configuration
- Multiple visualization computers with 18Tb data storage
- Large viewing room accommodates up to 20 people
- High resolution video camera for internet meetings

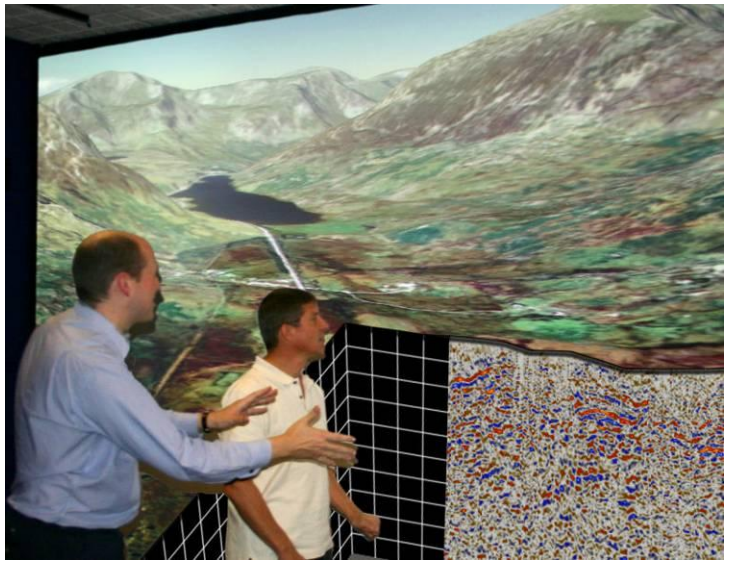
Flexible Meeting Space

Interactive Working Environment

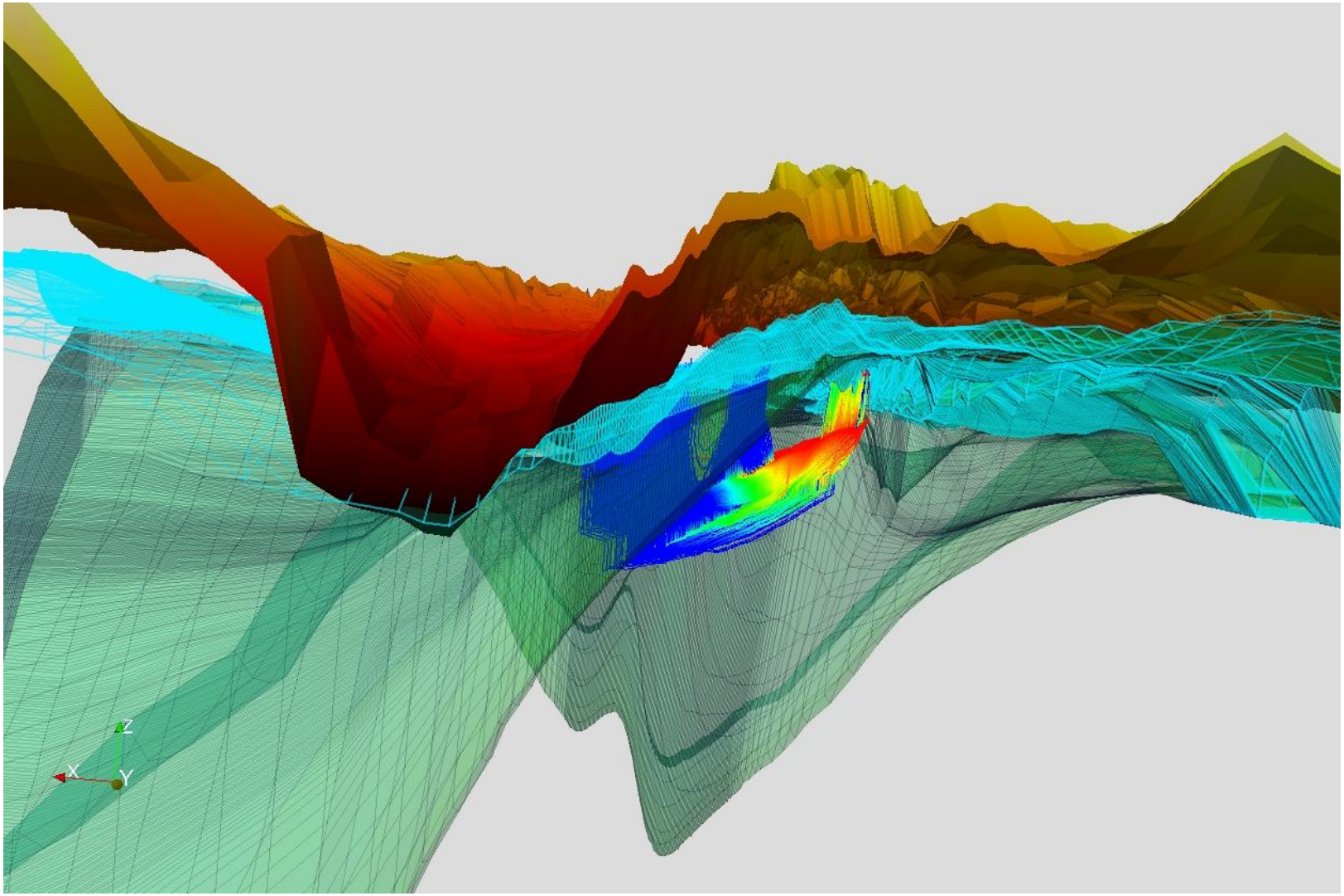


Collaborative Opportunities

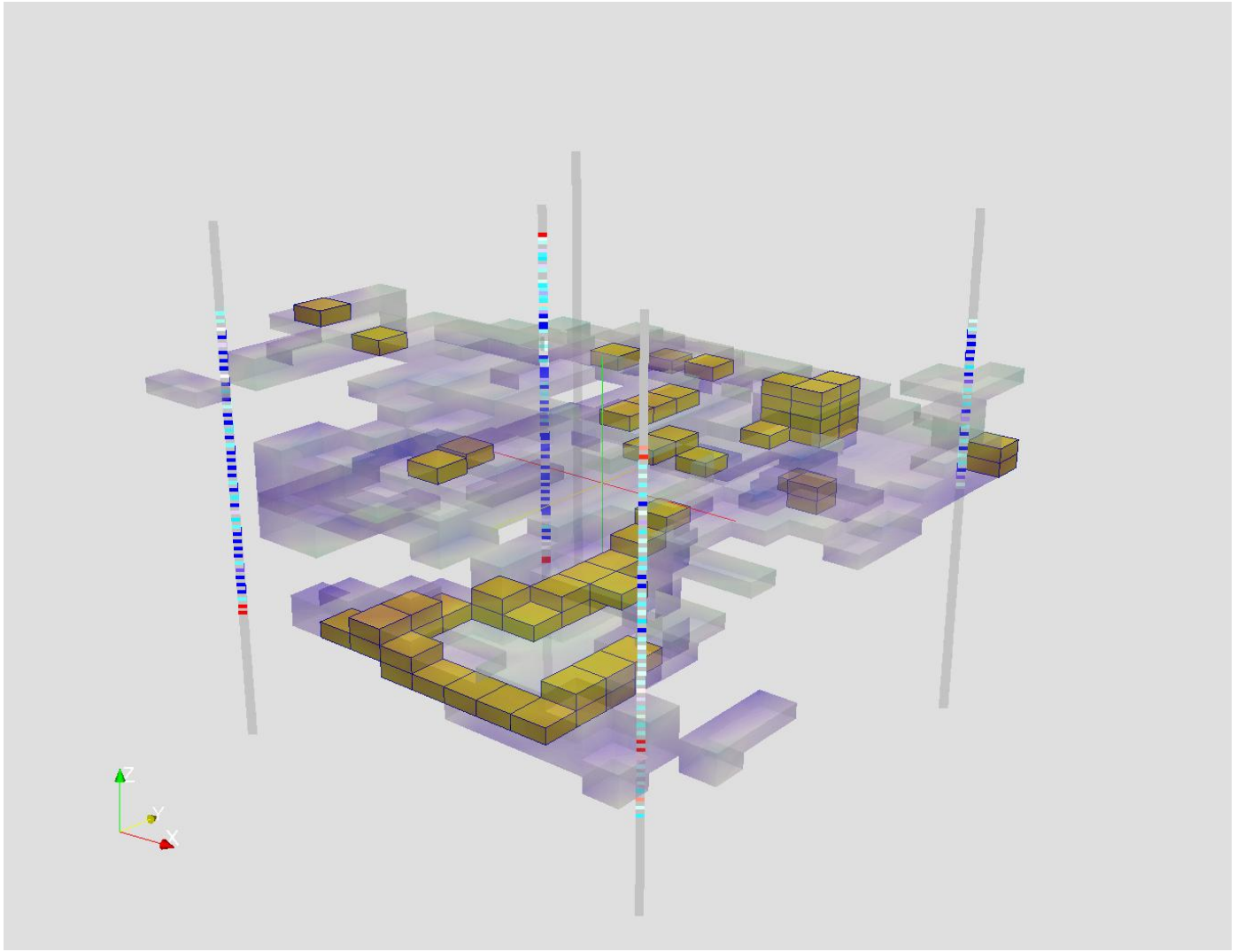
- Project team meetings
- Internet-based meetings
- Outreach workshops
- Visualization-focused presentations
- Education and training

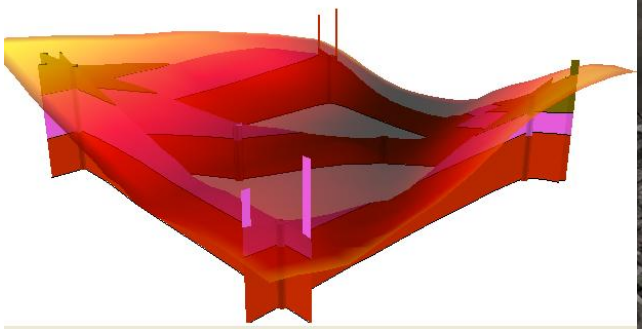


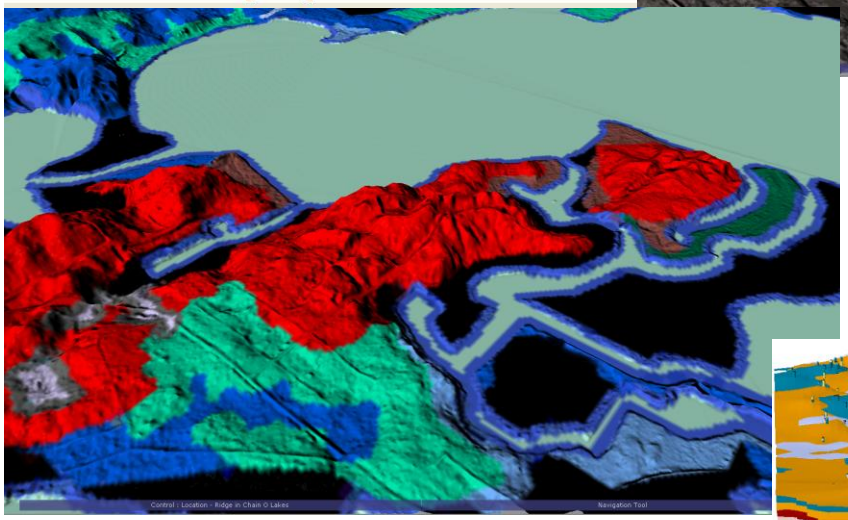
MFV: MODFLOW Viewer

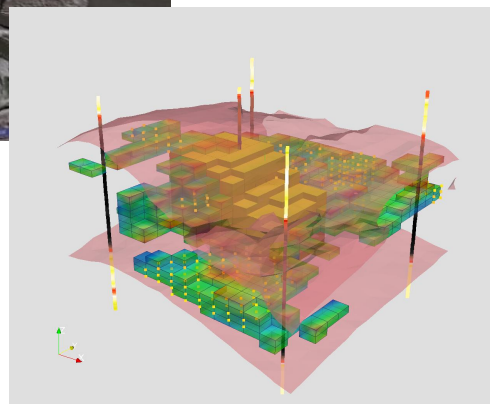


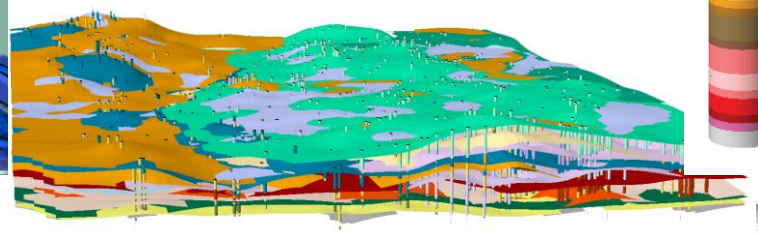
RVA (Reservoir Visualization and Analysis)

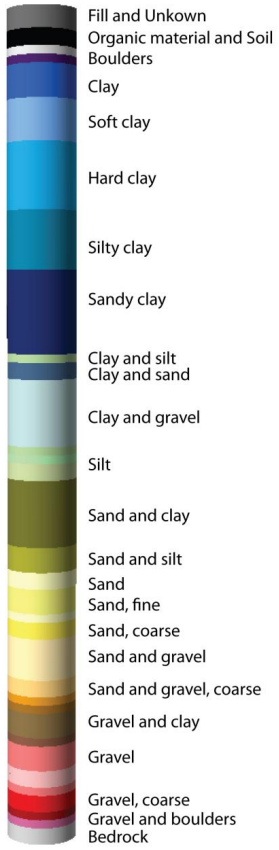
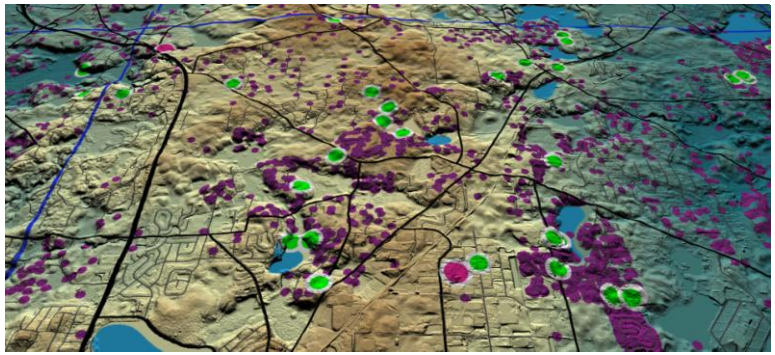
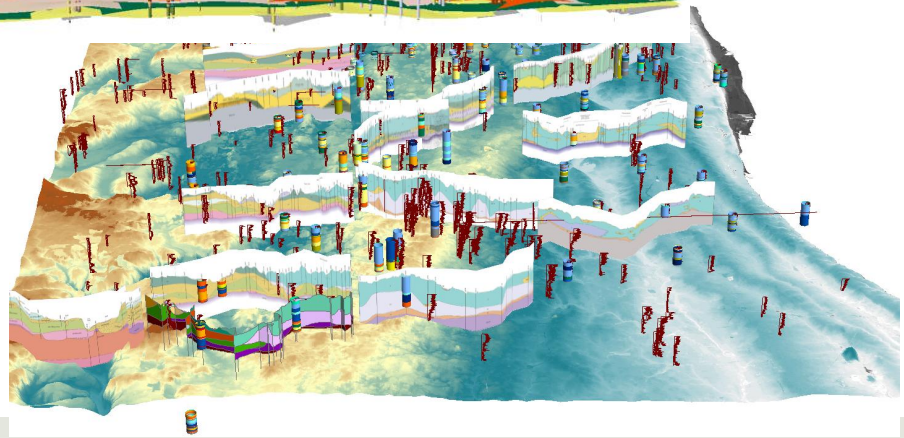











Fill and Unkown
Organic material and Soil
Boulders
Clay
Soft clay
Hard clay
Silty clay
Sandy clay
Clay and silt
Clay and sand
Clay and gravel
Silt
Sand and clay
Sand and silt
Sand
Sand, fine
Sand, coarse
Sand and gravel
Sand and gravel, coarse
Gravel and clay
Gravel
Gravel, coarse
Gravel and boulders
Bedrock