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Groundwater Resources
Association of California
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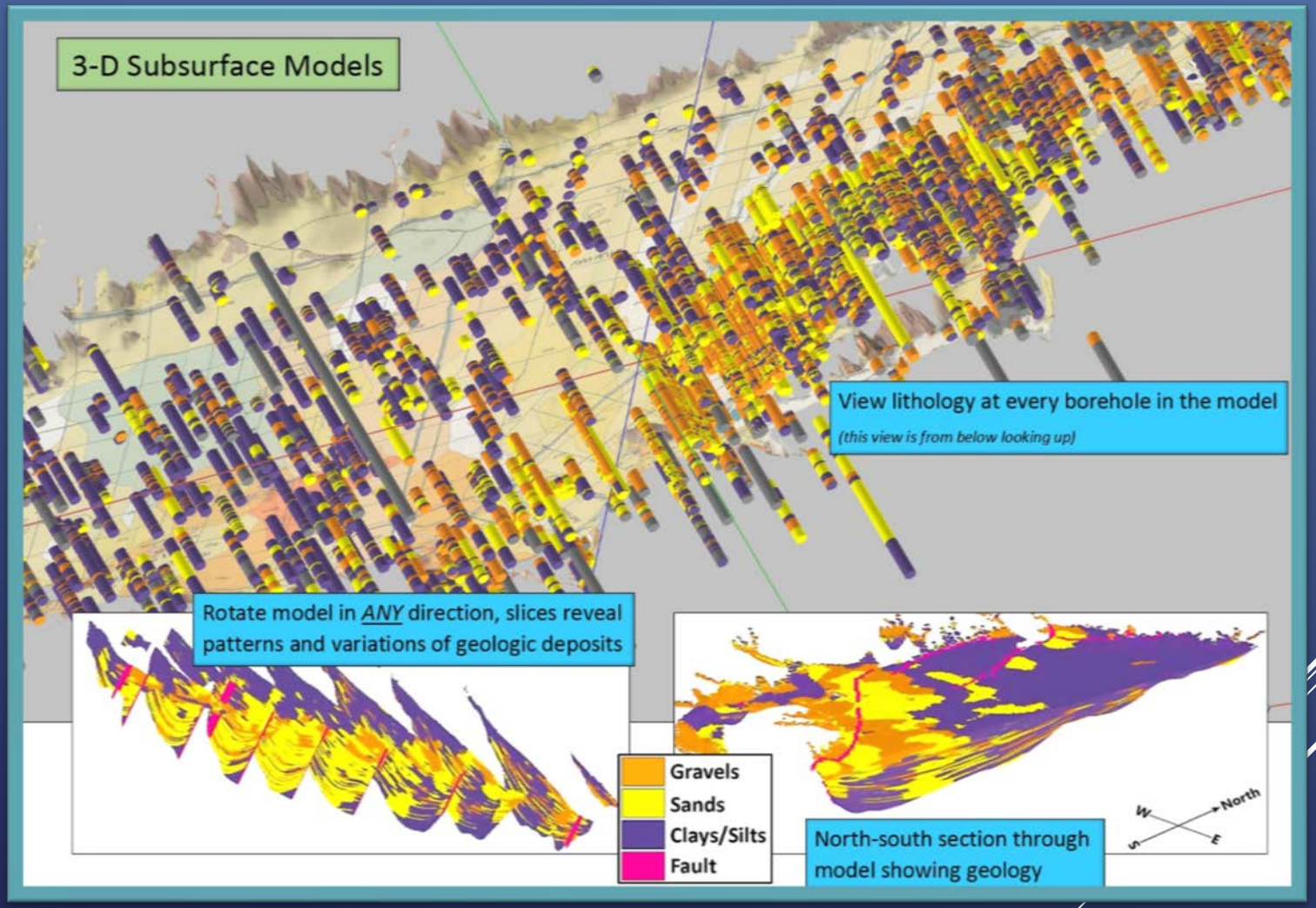
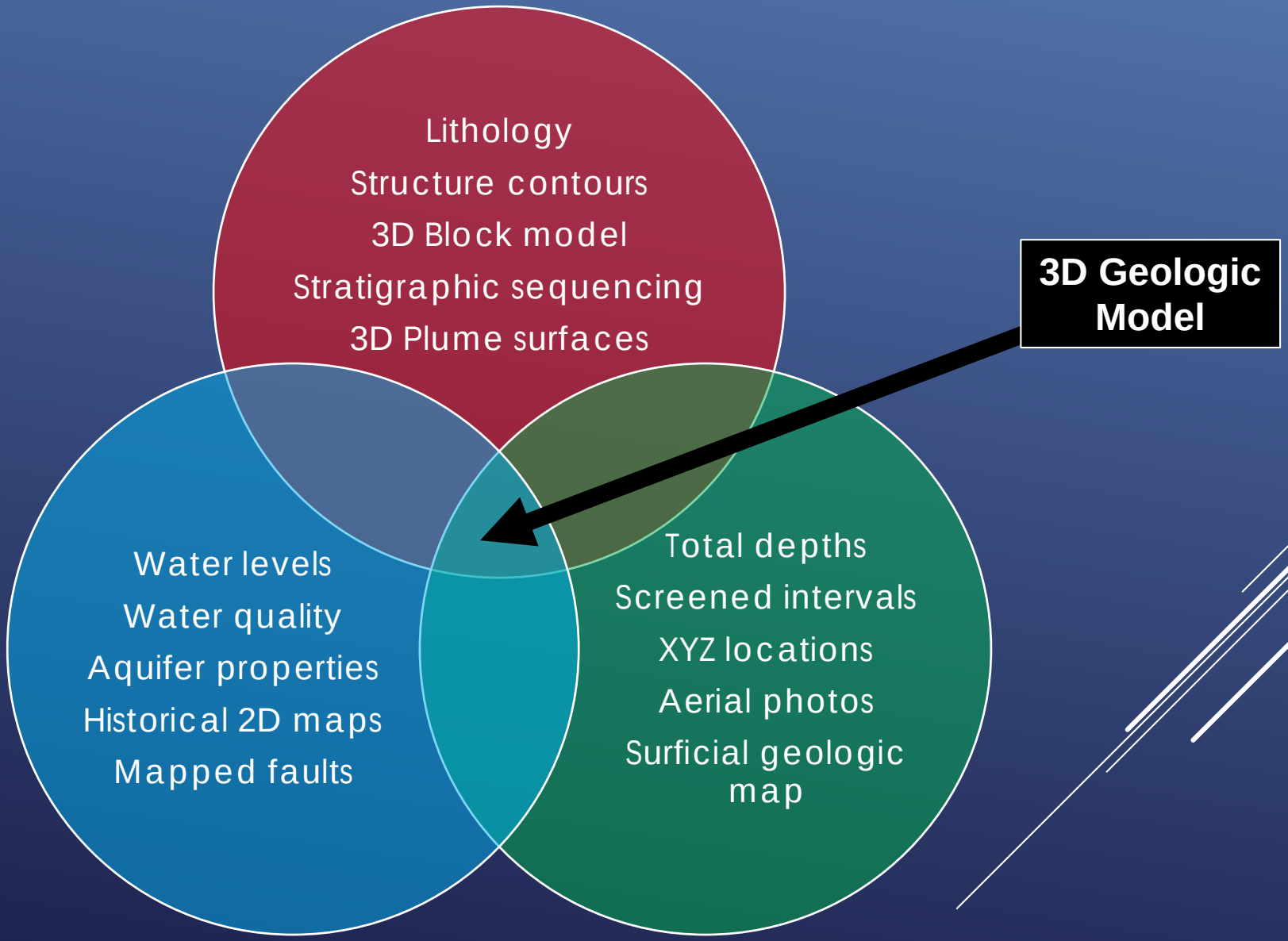
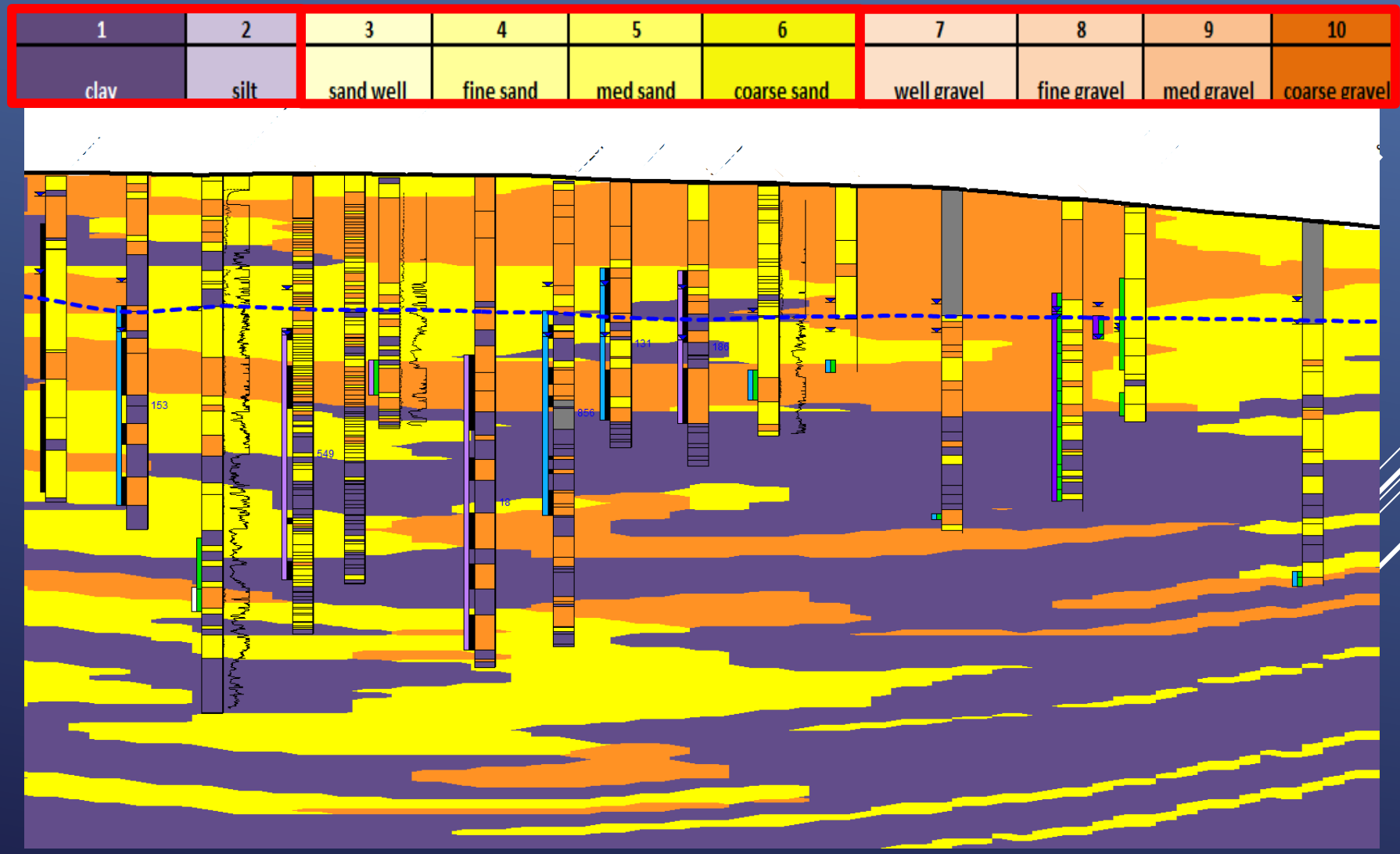
DEVELOPING 3D HYDROGEOLOGIC MODELS TO SUPPORT NUMERICAL FLOW MODELS



COMPONENTS OF 3D GEOLOGIC MODELS



LITHOLOGIC CLASSIFICATIONS INTEGRATED INTO A 3D BLOCK MODEL - can slice in any direction

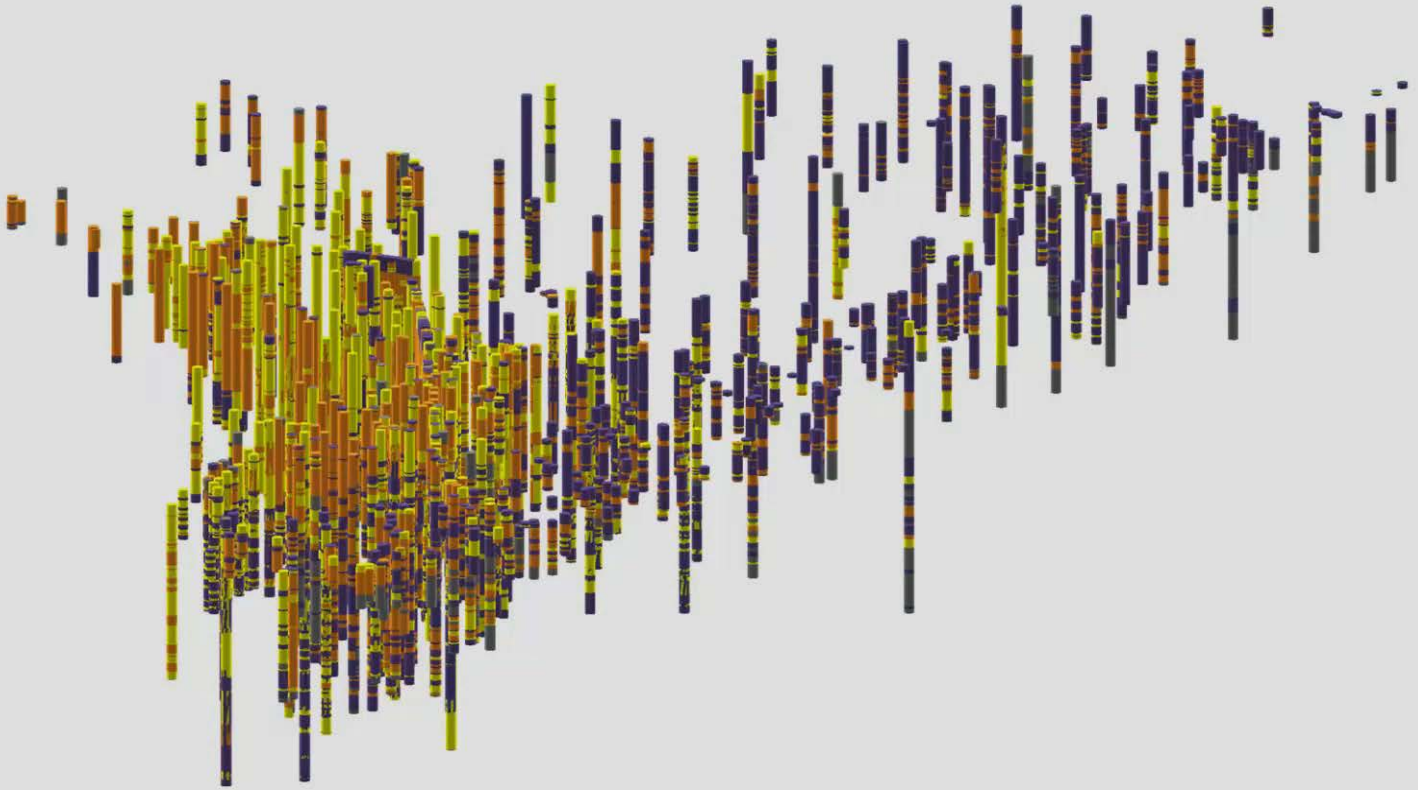


EXAMPLES OF 3D GEOLOGIC MODELS

1. Basin-wide integrated groundwater/surface water models

Basin-wide 3D Geologic Model mp4

Wells Used for Modeling



Clay and Silt
Sands (Fine to Coarse)
Gravels (Fine to Coarse)
Fault
Other (e.g., no log, bedrock)

EXAMPLES OF 3D GEOLOGIC MODELS

1. Basin-wide integrated groundwater/surface water models
2. Site-specific contaminant release models

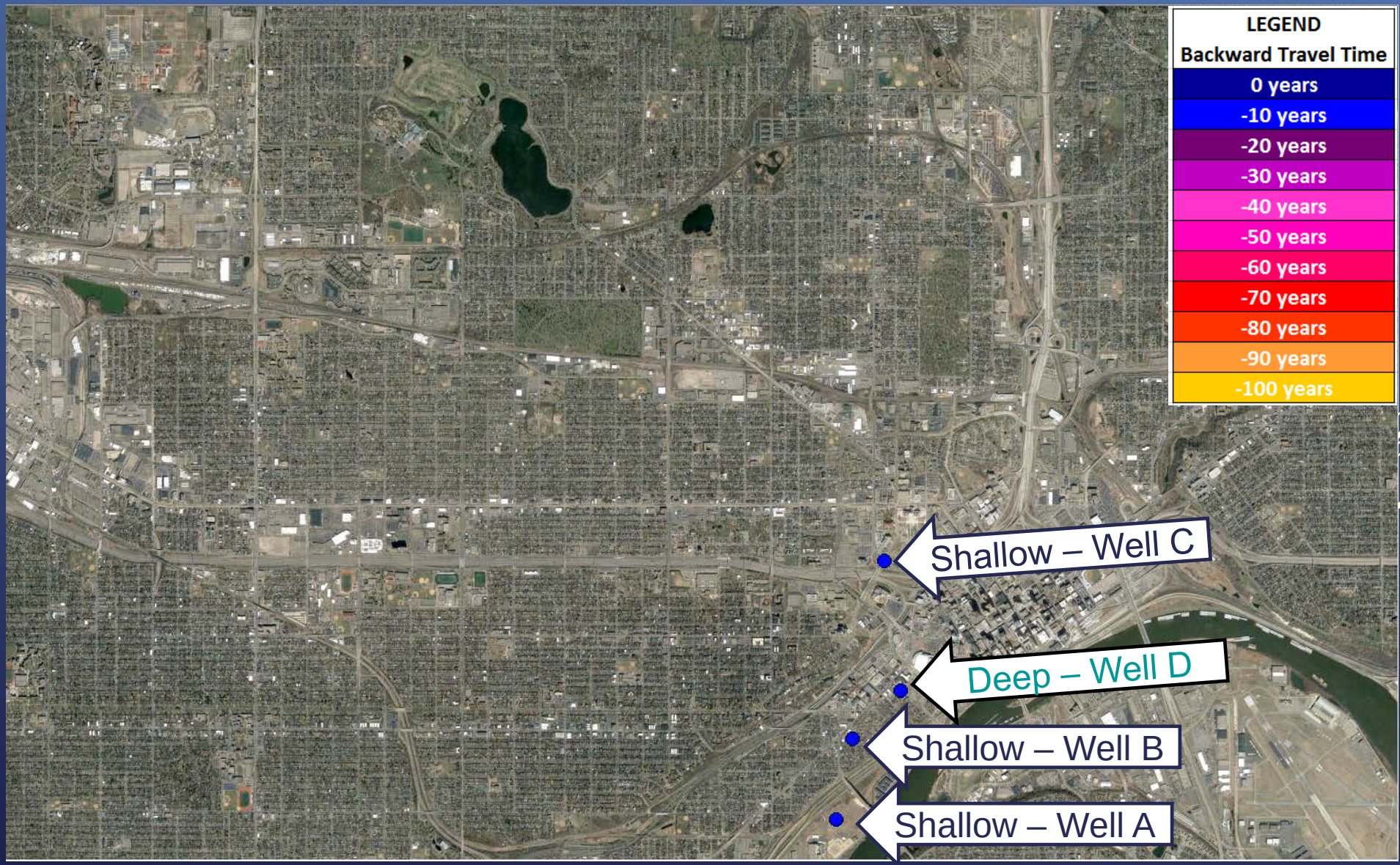
SITE-SPECIFIC CONTAMINANT RELEASE

EXAMPLES OF 3D GEOLOGIC MODELS

1. Basin-wide integrated groundwater/surface water models
2. Site-specific contaminant release models
3. Foundation for numerical flow models
    a) Particle tracking – both backward and forward
    b) Managed aquifer recharge
    c) Safe Yield

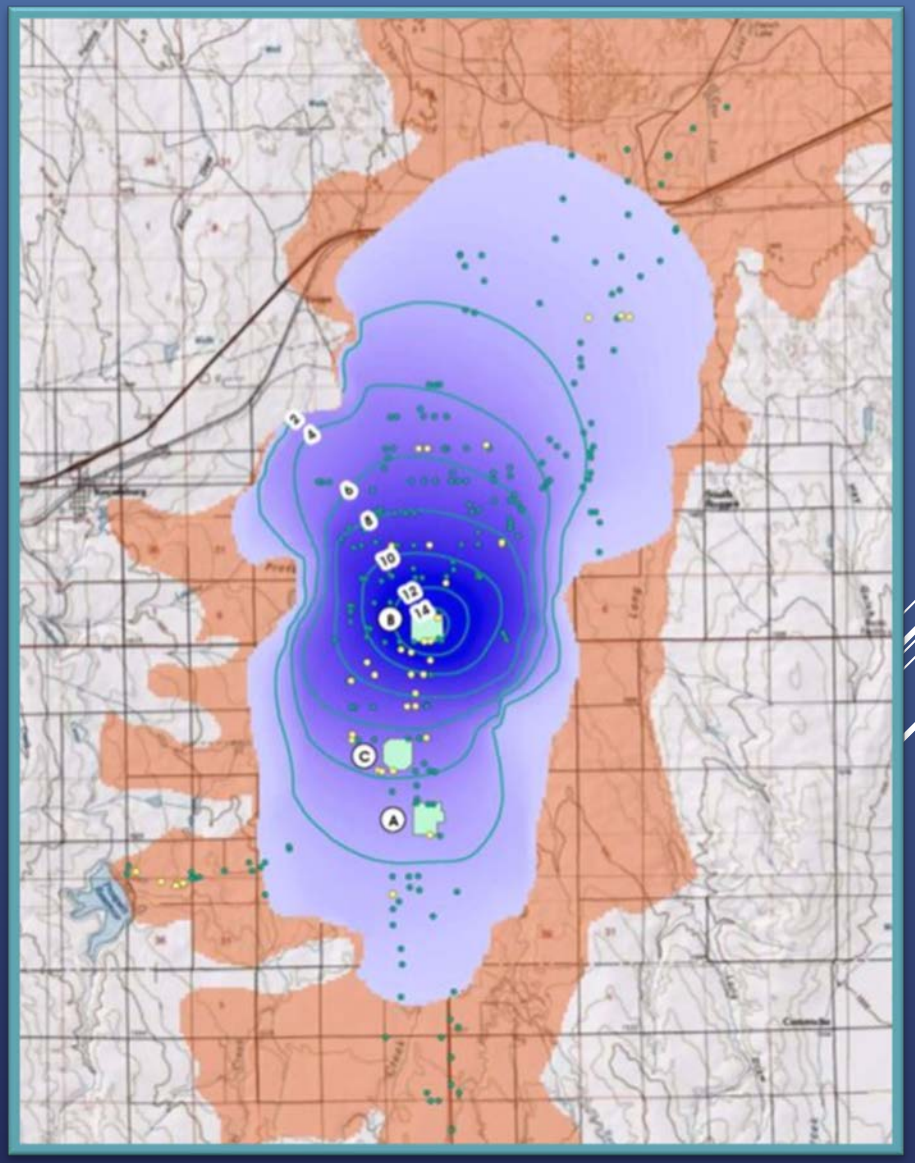
BACKWARD PARTICLE TRACKING

3 shallow & 1 deep wells: tracking particles back in time to the points where the specific particles entered the water table



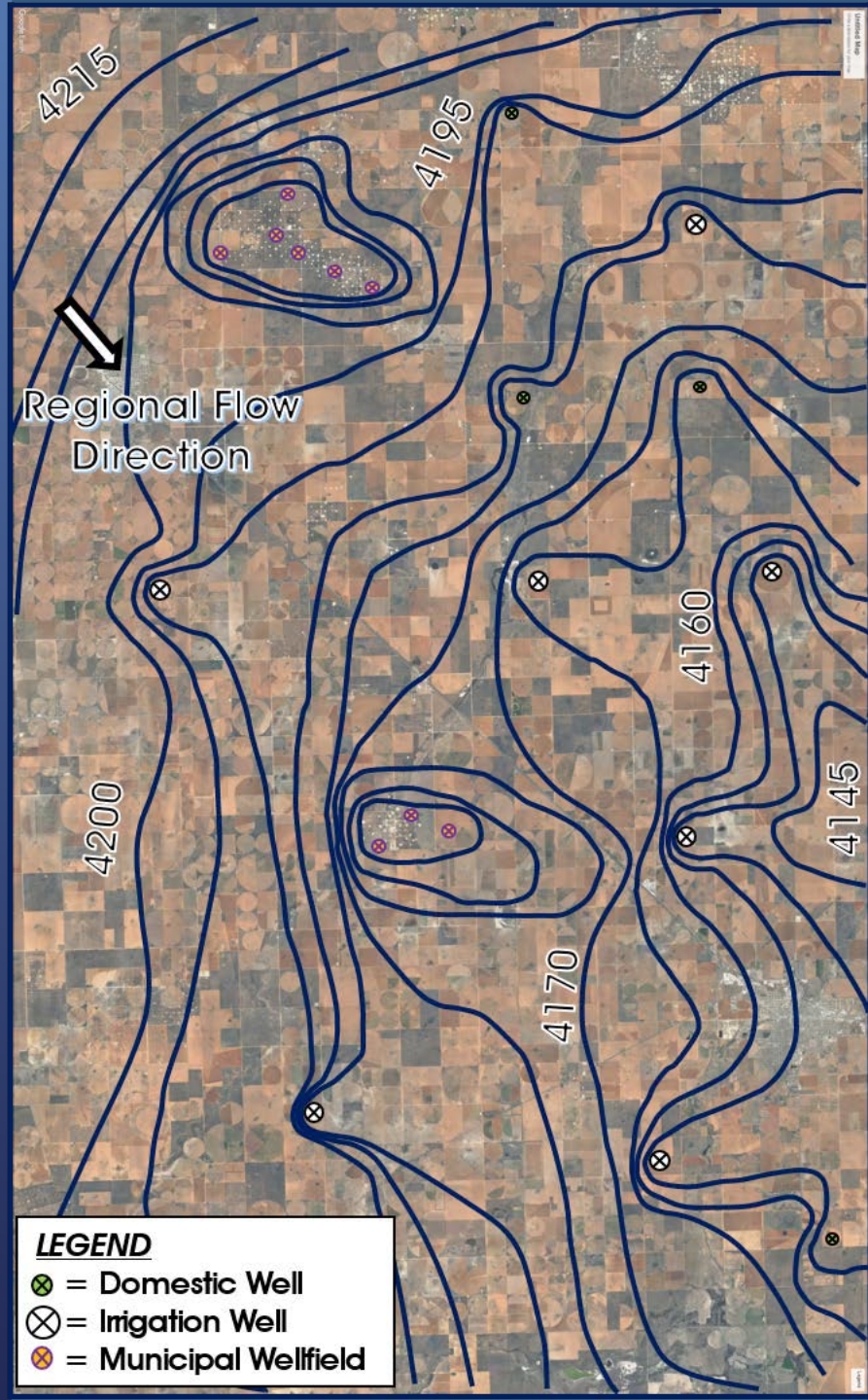
MANAGED AQUIFER RECHARGE EVALUATION AND DESIGN

- ✓ Identify and evaluate Managed Aquifer Recharge sites
- ✓ Model of three rapid infiltration basins in an alluvial system



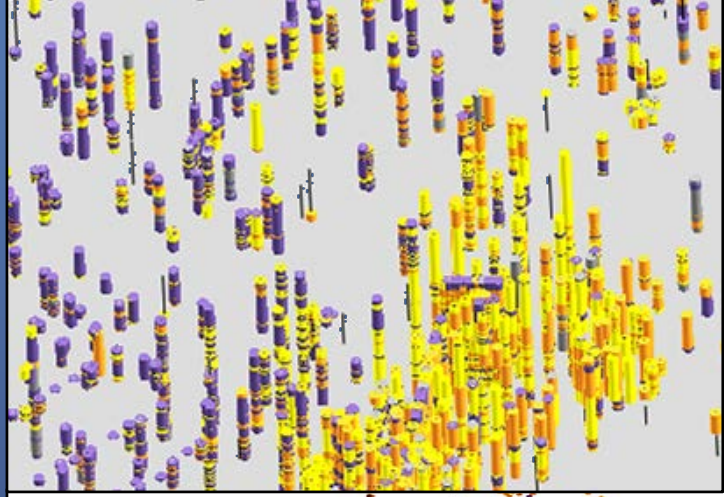
SAFE YIELD FOR SUSTAINABILITY

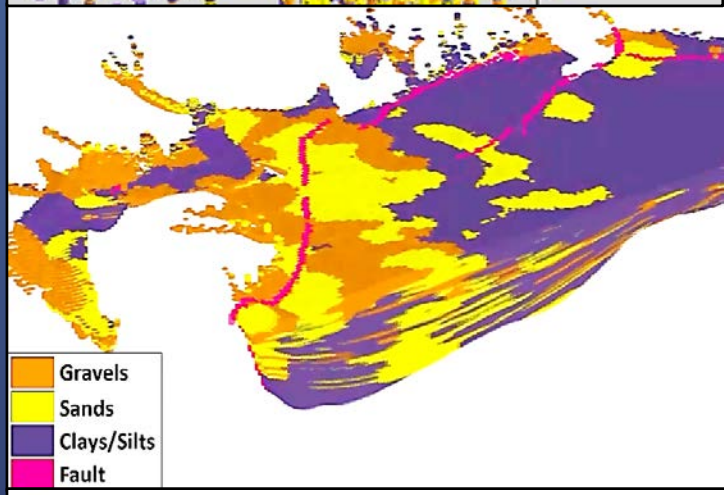
- Estimate aquifer yield that can be sustained by minimizing well interference

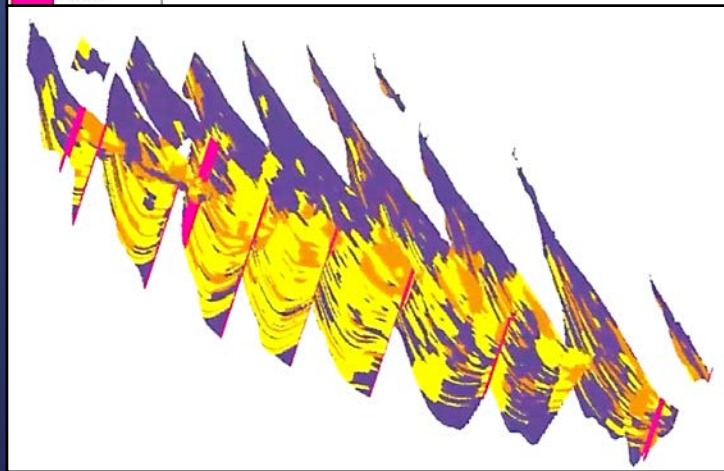


WHY IS A 3D GEOLOGIC FRAMEWORK IMPORTANT?

- Geology controls groundwater flow
- Identify aquifer boundary conditions, faults, and other flow barriers
- Identify preferential flow pathways
- 2D methods don't allow seeing what's in front, behind, beneath, above
- Stratigraphic sequencing allows for identifying correlations and discontinuities







THANK YOU

RECOGNITIONS

- Lytle Water Solutions' staff
- Dr. Eileen Poeter
- RockWare

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