

Surface Water / Groundwater Interaction Study

Progress Update – August 2019

Presented by James Bené, P.G.

Purpose of Study

- Explore and quantify surface / groundwater interactions
 - Direction of flow (surface to groundwater or vice-versa)
 - Rate of flow
 - Flow volume
 - Seasonal fluctuations
 - Longer-term fluctuations
 - Significance of alluvial storage and surface/ groundwater interactions in overall water budget

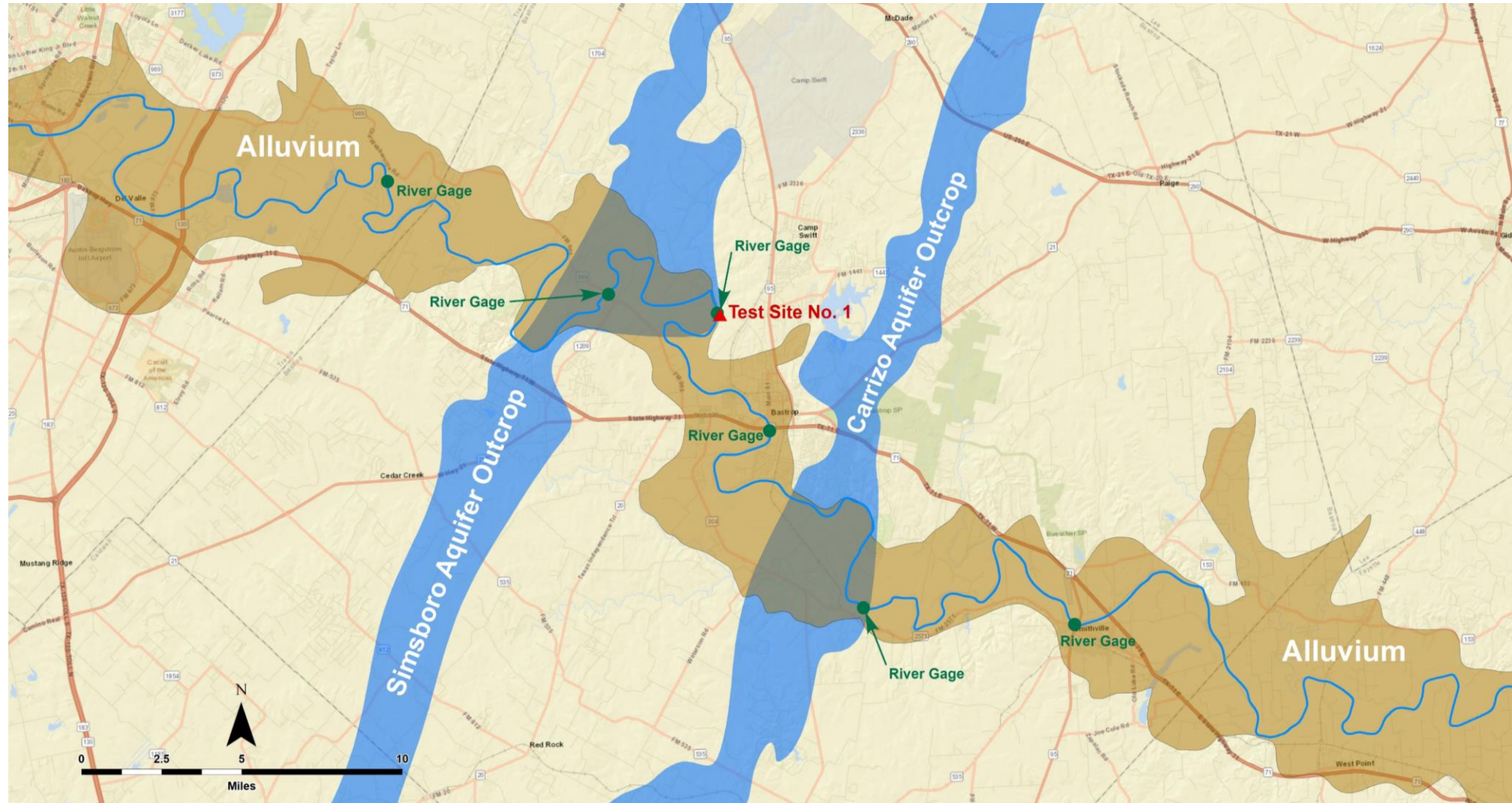
GAM Limitations

- Recently-updated GAM incorporates modifications for improved surface water / groundwater interactions:
 - Two new model layers: Alluvium and Shallow/Transition
 - Refined grid in areas where rivers/streams cross formation outcrops
- New layers and refined grid theoretically allow for more-accurate simulations
- Very little real-world data to support the refinement
 - (Lots of new, smaller model cells but what hydraulic properties should be assigned to them?)

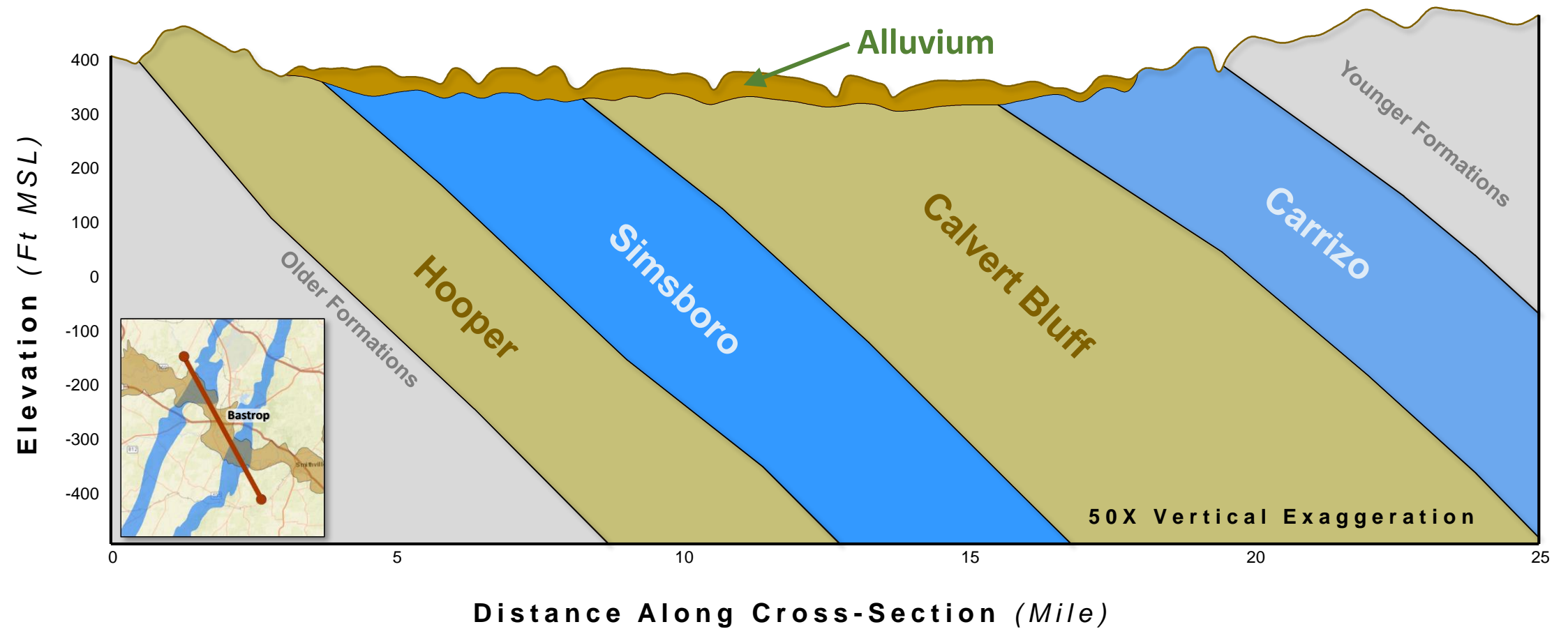
Study Goals

- Explore and assess various data collection and evaluation techniques
- Obtain long-term measurements from one location
 - River level oscillations
 - Alluvial groundwater level
 - Underlying aquifer groundwater levels
- This project represents a “pilot” study – more sites to come

Study Area




Cross-Section Diagram



Test Site No. 1





LCRA Test Site No. 1



Drilling Test Site No. 1 (LCRA Lake Bastrop Intake)

Pilot Hole Drilling – Auger (0-55 feet)



Pilot Hole Drilling - Auger (0-55 feet)



Pilot Hole Drilling – Mud Rotary (55-120 feet)



Future Work

- Evaluate and select alternative project site
 - Presence of permeable alluvial sands/gravels in one or more layers
 - Proximity of river gage
 - Long-term access
 - Presence of major aquifer outcrop sands (ideally)
- Conduct test drilling and construct monitoring wells
- Install dataloggers and telemetry electronics
- Evaluate the results!
 - Hydraulic gradients, flow directions, flow velocity, etc.

Questions?