Updated Interfaces at the SRS F-Area for the ASCEM demonstration

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The current SRS F-Area flow model consists of three units (Upper Aquifer: UTRA, Tan Clay Confining Zone: TCCZ, and Lower Aquifer: LUTRA) (Figure 1; Bea et al., 2013). The domain was divided by four hydrostratigraphic interfaces (from top): ground surface, Tan Clay top, Lower Aquifer top, and Gordon Clay Unit top.

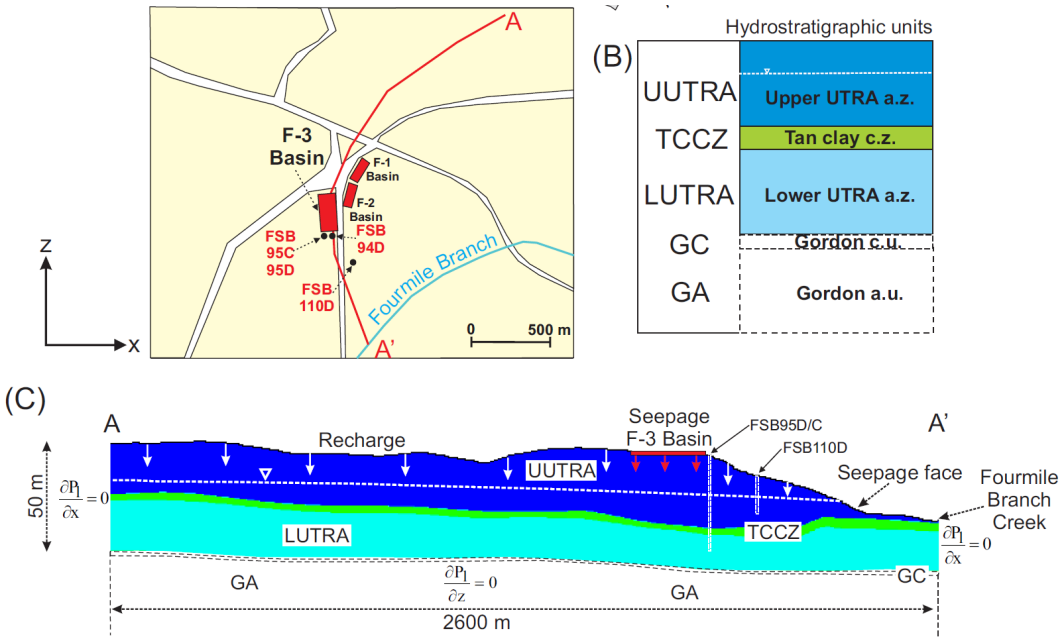
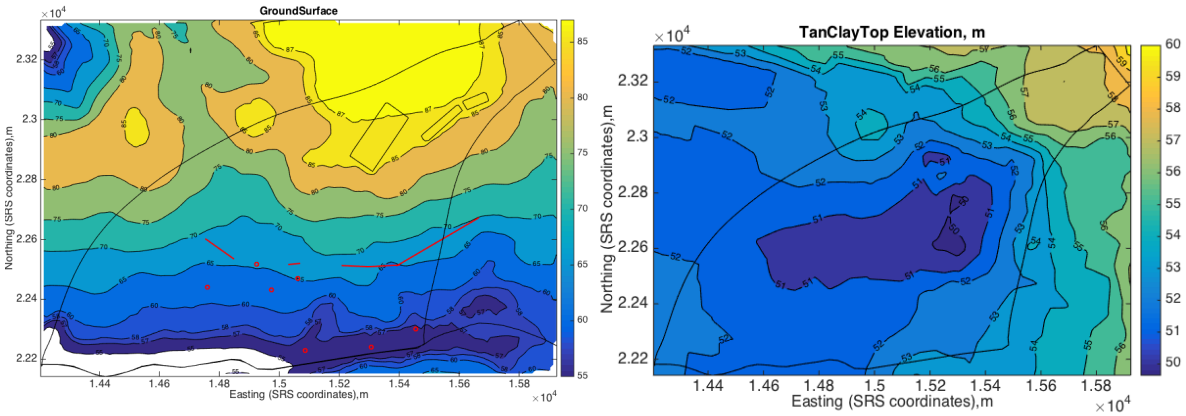


Figure 1. SRS F-Area flow model (from Bea et al., 2013).

The current mesh (Version 2.1) for the SRS F-Area simulation was developed based on the hydrostratigraphic interfaces used for the PORFLOW model created in 2004 (Flach, 2004). The mesh is archived here: https://meshing.lanl.gov/proj/ASCEM_FBasin/index.html#V2_MESH. The V-2.1 interfaces were estimated based on the datasets before 2000 (Figure 2).



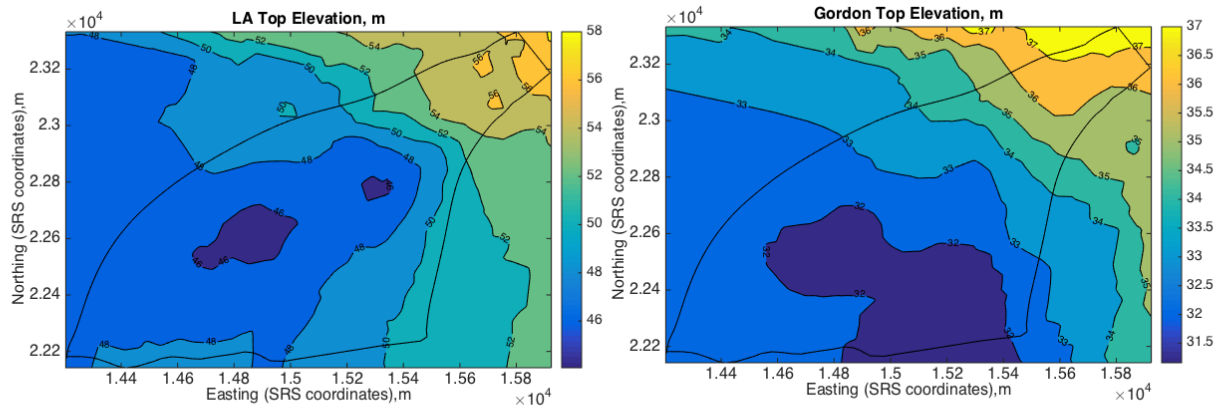


Figure 2. The original interfaces in the Ver.-2.1 mesh.

Since 2000, there have been additional drilling activities as well as cone penetrometer testing (CPT) at the site to measure the interface depths. Particularly, the CPT data identified the "troughs" (or depressions) of the aquifer bottom, which is considered to have a significant impact on the contaminant transport at the site. In addition, the Tan Clay layer estimation was improved by the seismic dataset (Wainwright et al., 2014). The interfaces are updated including those CPT datasets (Figure 3). The interfaces are estimated on the **10mx10m-resolution grid**, **in meter** and **in the SRS coordinates**.

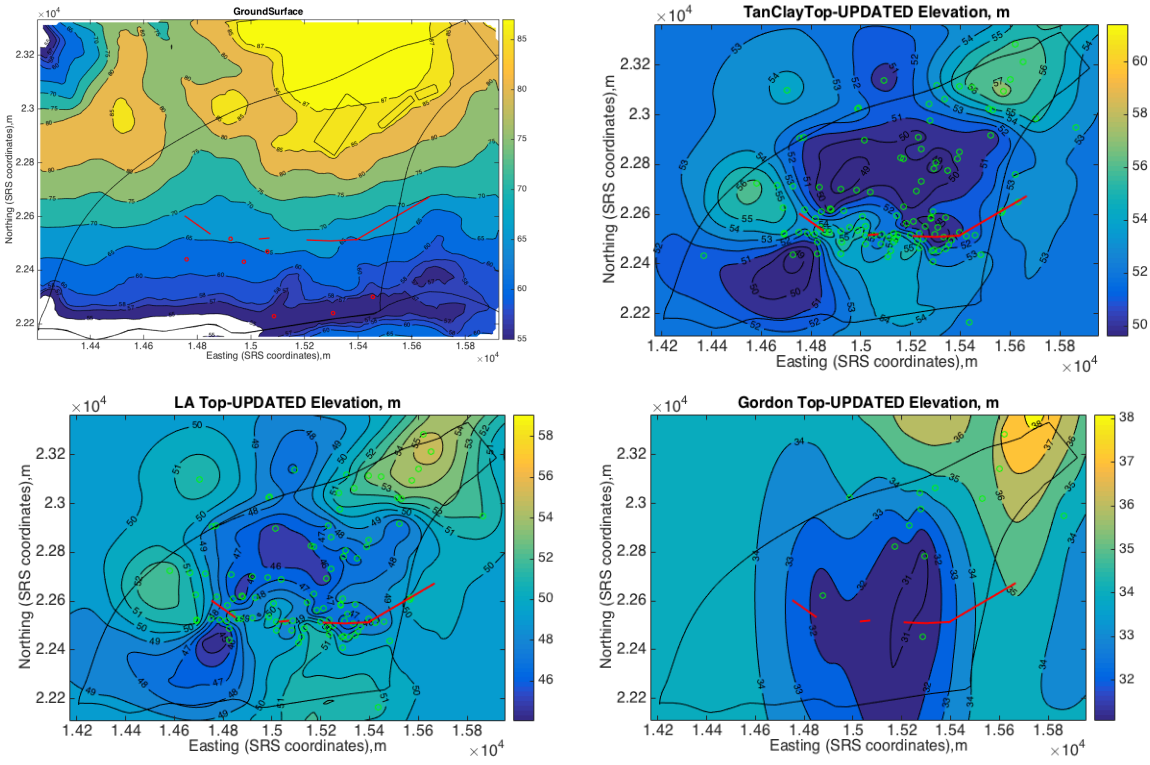


Figure 2. The updated interfaces (the ground surface is the same as Figure 2).

Package:
Directory name: Mesh_interfaces20150406
Files:
- groundsurface_interpolated_meter.txt → Ground surface
- surf5_interpolated_meter-UPDATED.txt → Tan Clay top
- surf4_interpolated_meter-UPDATED.txt → Lower Aquifer top
- surf3_interpolated_meter-UPDATED.txt → Gordon Clay Unit top

In each file, each row is {Easting, Northing, Interface elevation} in meter. The easting and northing are in SRS coordinates.

References:
Flach, G. P., (2004). Groundwater Flow Model Of The General Separations Area Using Porflow (U), WSRC-TR-2004-00106.

Bea, S. A., Wainwright, H., Spycher, N., Faybishenko, B., Hubbard, S. S., & Denham, M. E. (2013). Identifying key controls on the behavior of an acidic-U (VI) plume in the Savannah River Site using reactive transport modeling. Journal of contaminant hydrology, 151, 34-54.

Wainwright, H. M., Chen, J., Sassen, D. S., & Hubbard, S. S. (2014). Bayesian hierarchical approach and geophysical data sets for estimation of reactive facies over plume scales. Water Resources Research, 50(6), 4564-4584.