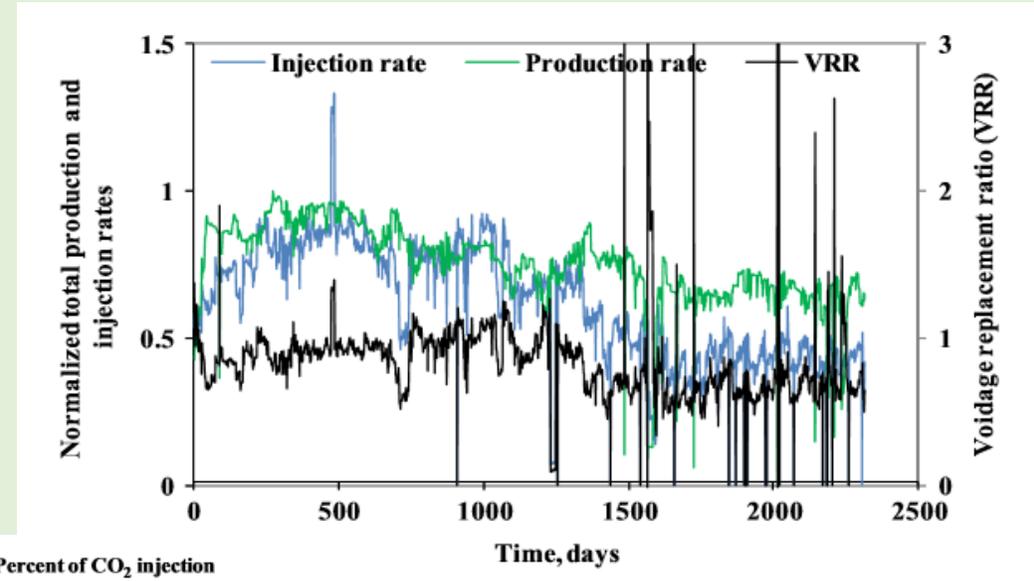
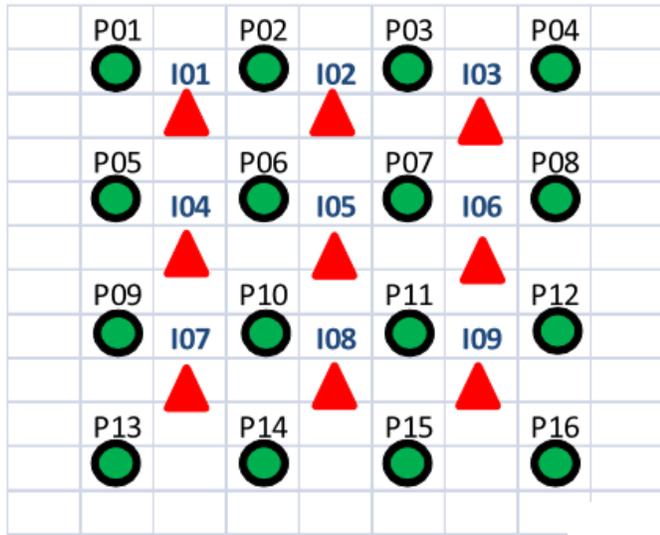


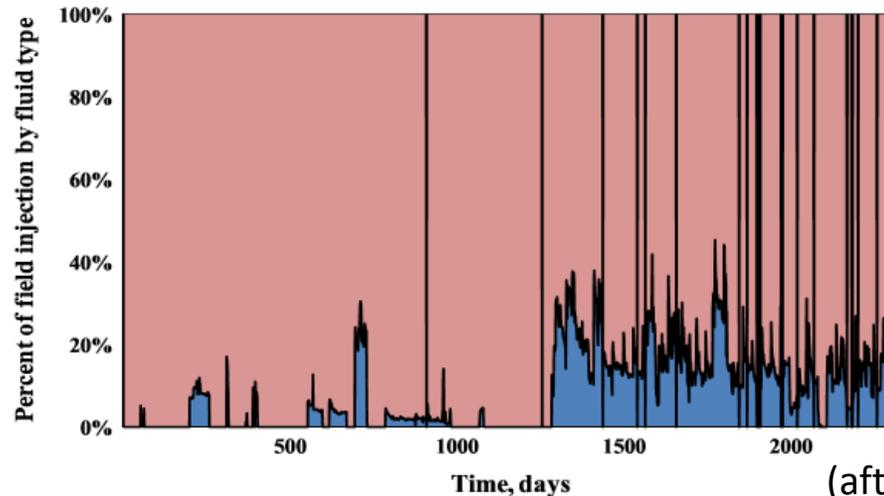
Assessing Reservoir Performance in Water-Alternating-Gas Flood & Fluid Disposal

Shah Kabir, U. of Houston
ckabir@central.uh.edu

Production/Injection Performance in MWAG

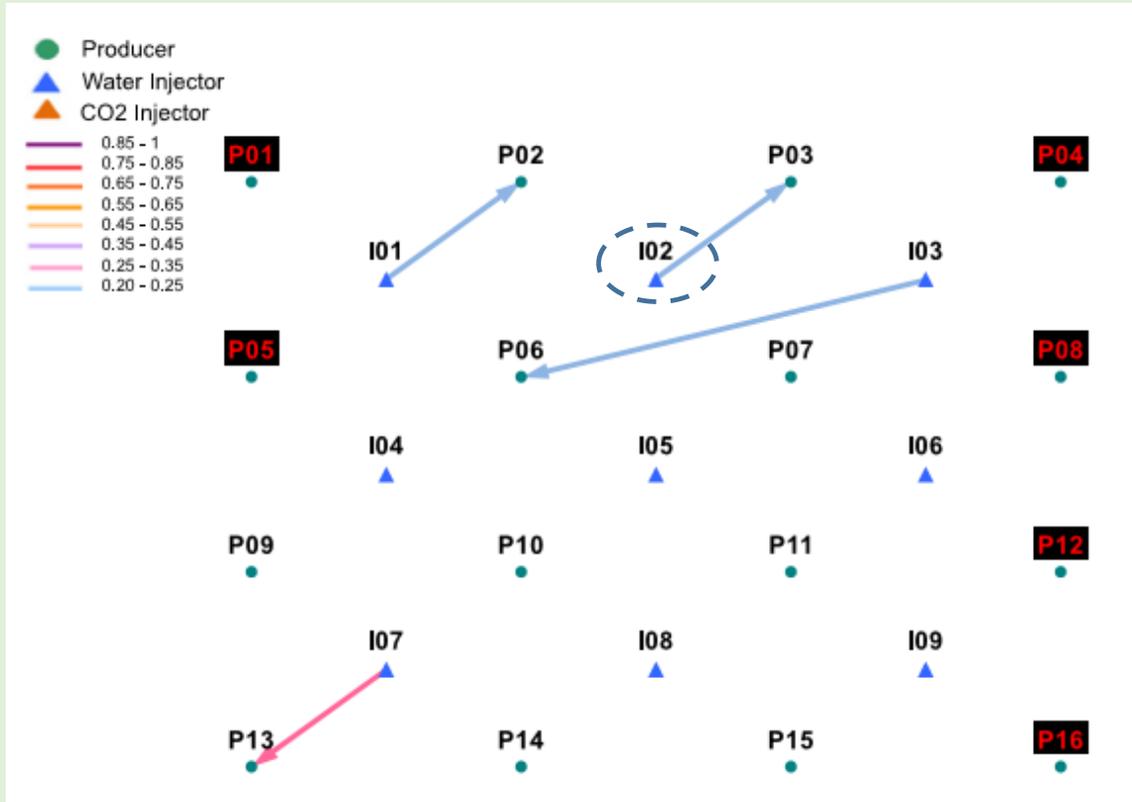


■ Percent of water injection ■ Percent of CO₂ injection

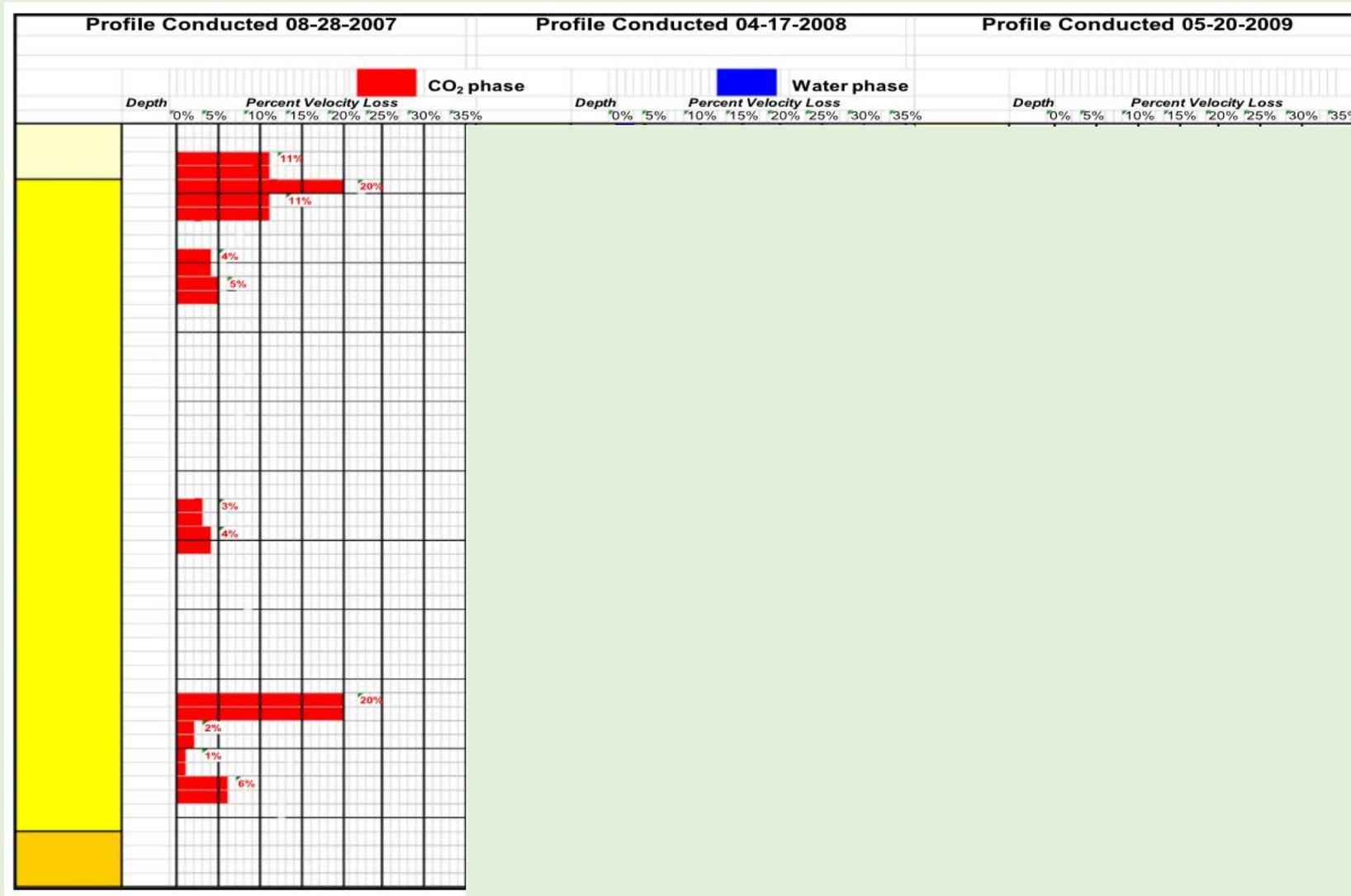


Connectivity Maps During Water & CO₂ Injection Cycle

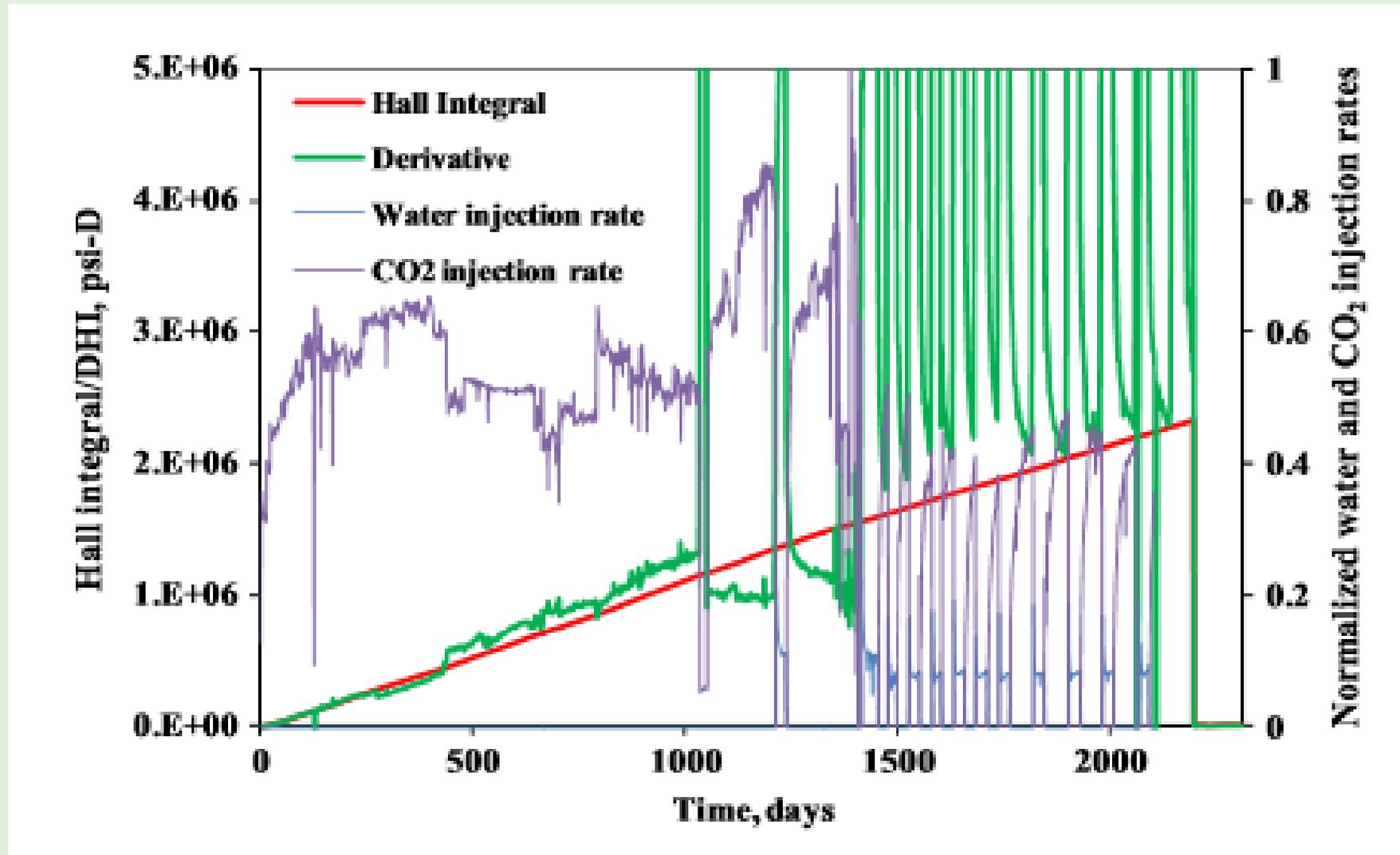
Water Cycle



Flow Profiles Help Understand I02 Injector Performance



Spikes Suggest Flow Impediments in Alternating Cycles in I02



Induced Seismicity in Class-II Disposal Wells

FIGURE E- 39: HANNA TANDEM PLOT OF CUMULATIVE EARTHQUAKES AND HALL INTEGRAL WITH DERIVATIVE

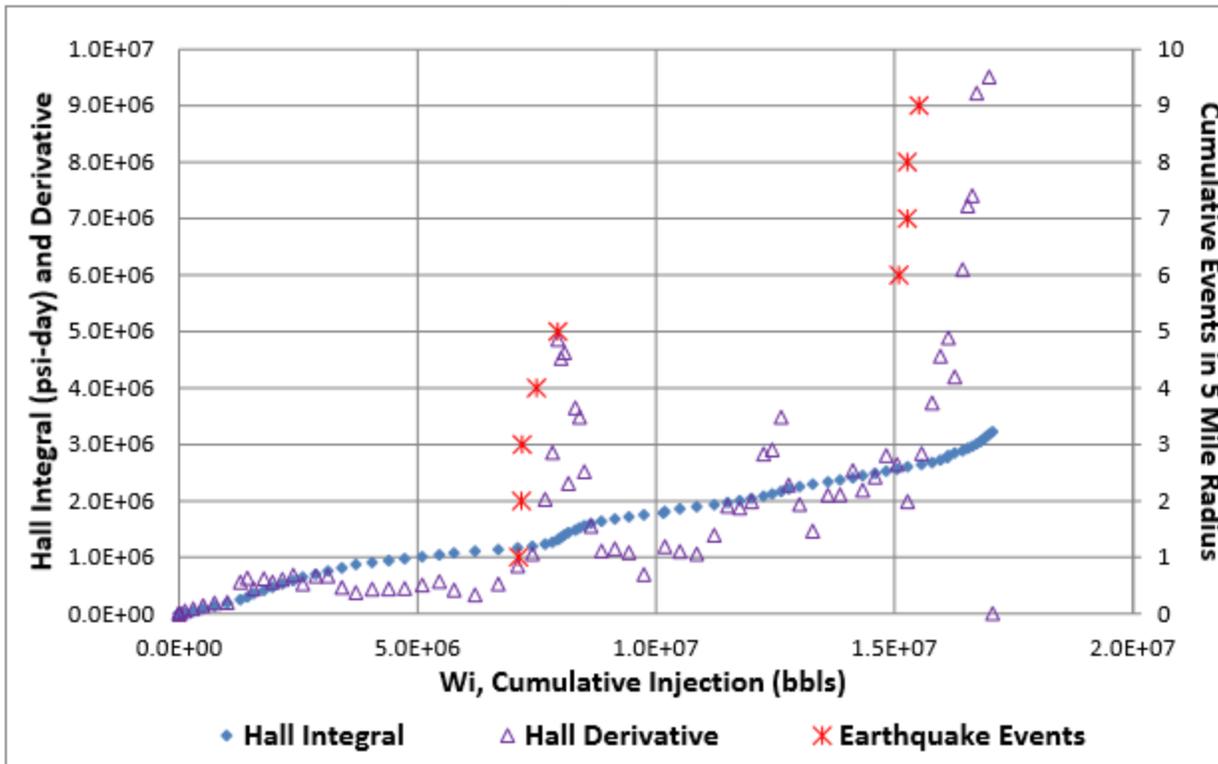
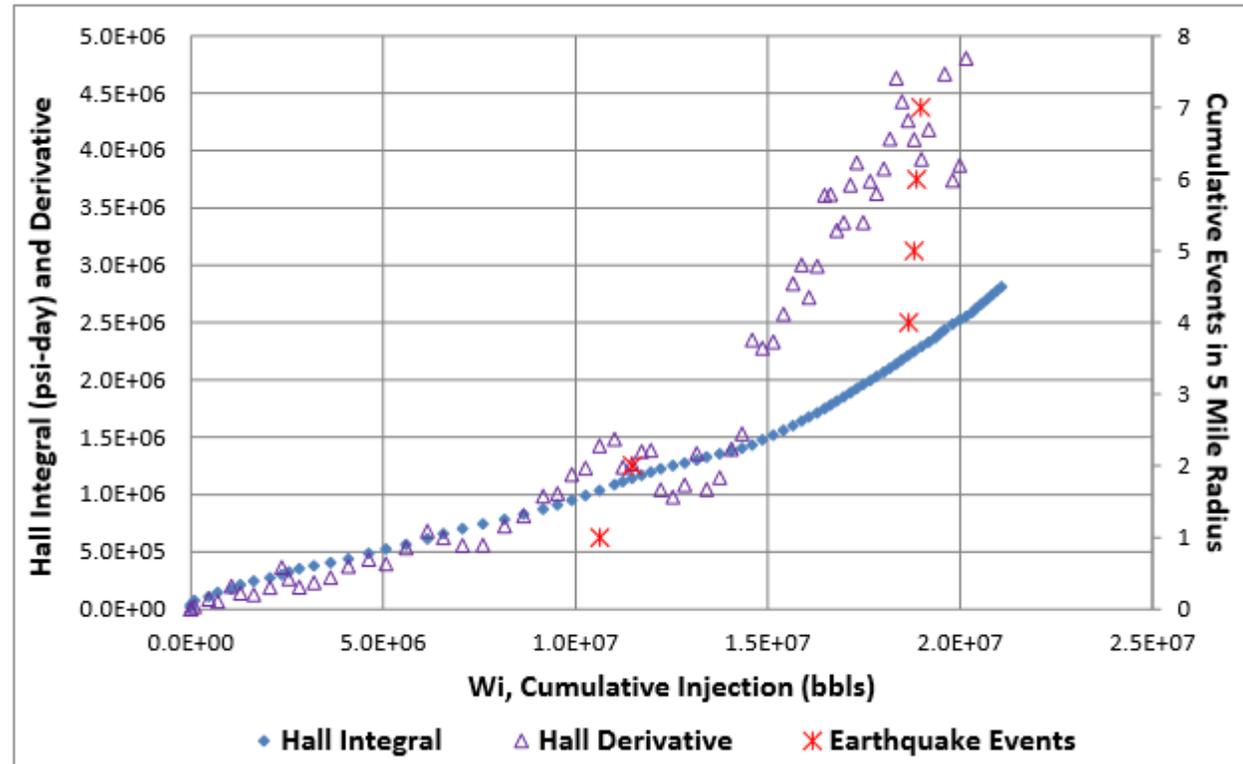


FIGURE E- 45: JOHNSON COUNTY TANDEM PLOT OF CUMULATIVE EARTHQUAKES AND HALL INTEGRAL WITH DERIVATIVE



{after EPA: Minimizing and Managing Potential Impacts of Injection-induced Seismicity From Class II Disposal Wells: Practical Approaches (Feb. 6. 2015)}

Trigger Point Limits Water & CO₂ Disposal

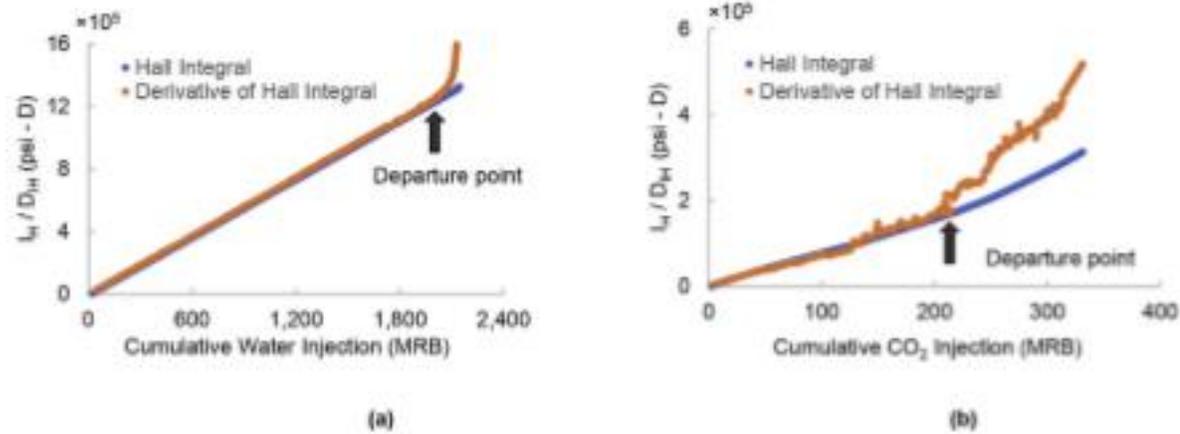


Fig. 6. Departure point identification in the modified-Hall plot; (a) waste-water disposal and (b) CO₂ injection.

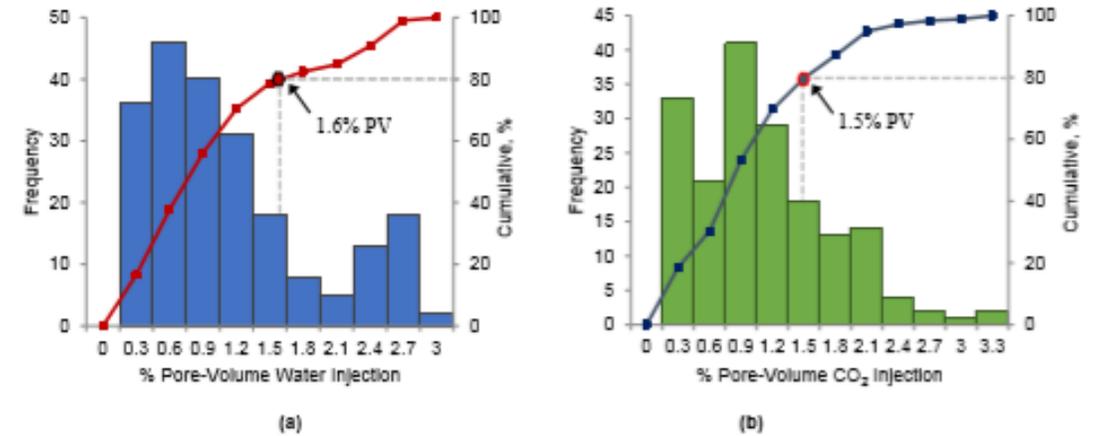


Fig. 10. Histograms of percent pore-volume injection for waste-water disposal (a) and CO₂ injection (b).

(after Phan et al. *JPSE* 170 (2018) 197-205)

Discussion Items

- 1. How Does Uncertainty in Alternating Fluid Injection Help Assess Sequestration Potential?**
- 2. Do We Have Much Room for Significant CO₂ Sequestration in a Mature Flood? Should We Use Water Cut as a Metric &/or Any Other?**
- 3. What Steps do we Follow to Assess Injection Performance to Minimize Seismic Events?**

Discussion Items

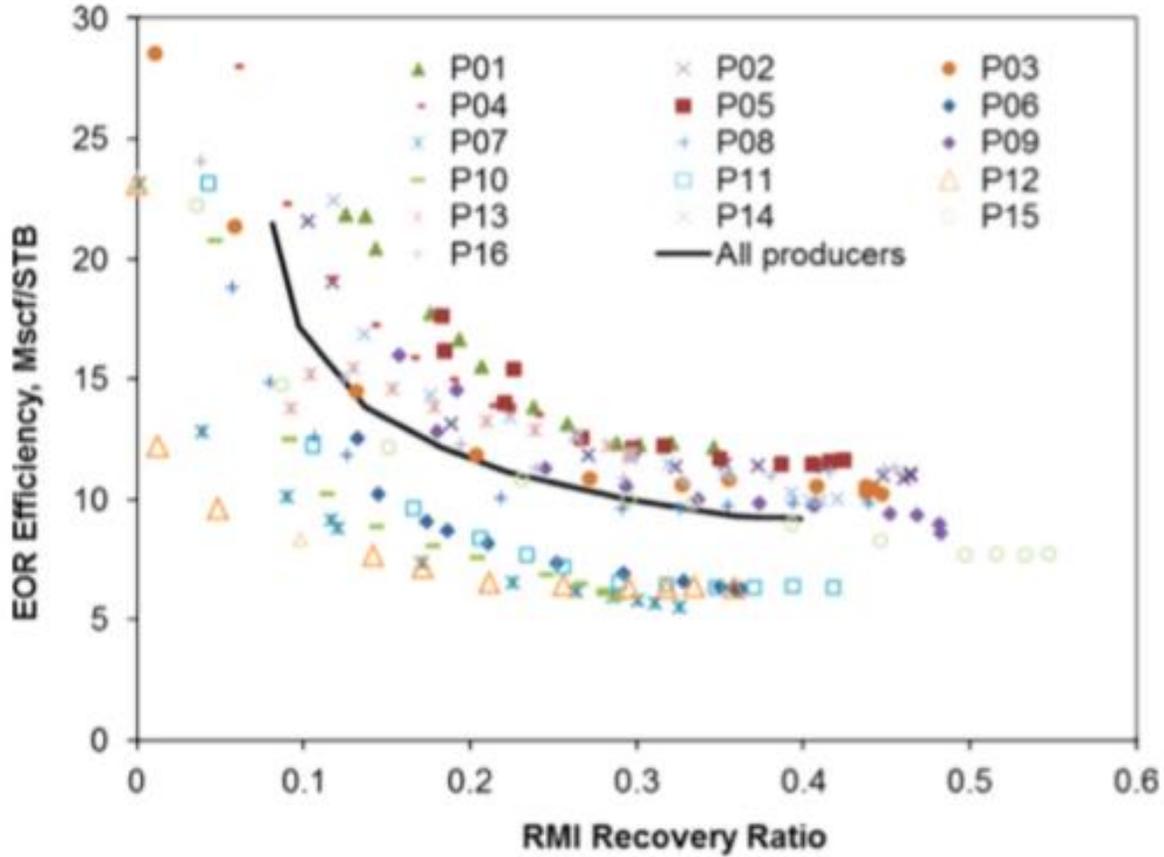
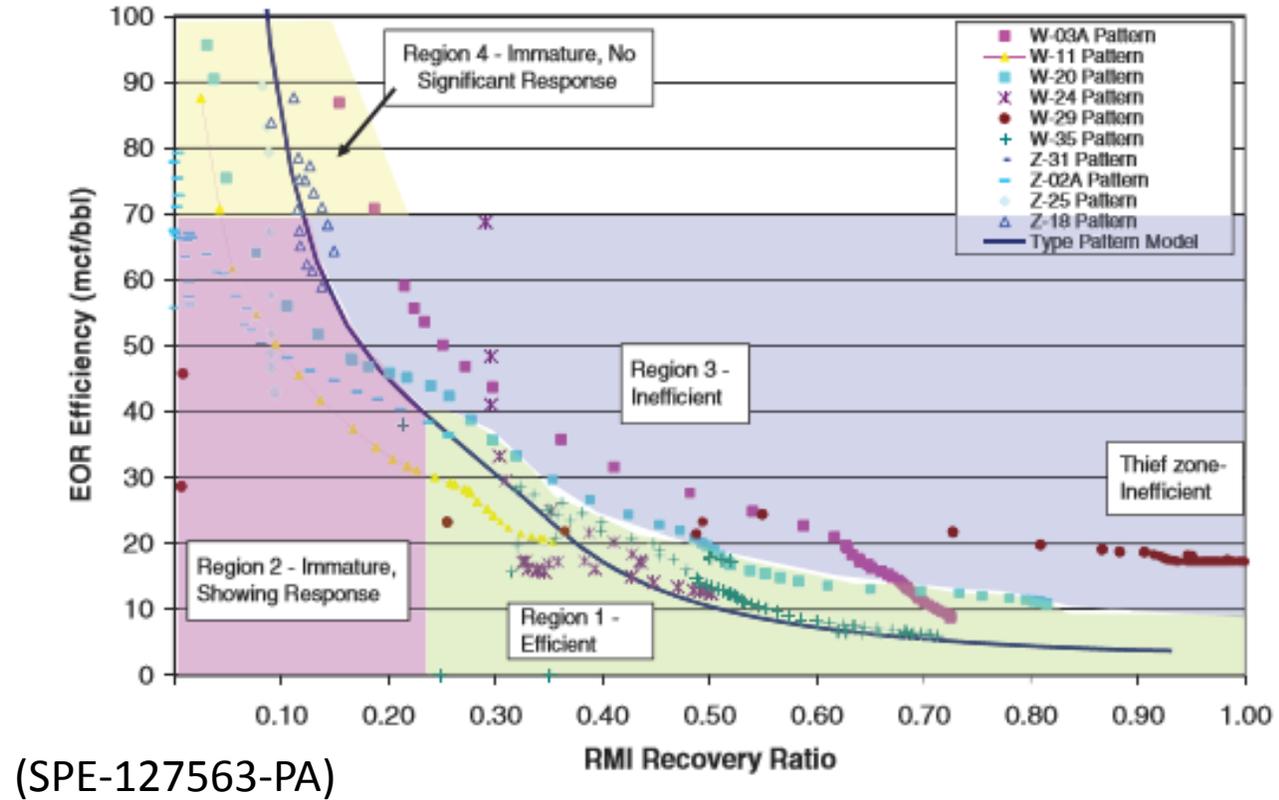


Fig. 17. EOR-efficiency-measure plots for individual well performance assessment.



(SPE-127563-PA)

Fig. 11—EWE EOR-efficiency-measure plots, used to manage and optimize the WAG flood in EWE.