

OWP | OFFICE OF  
WATER  
PREDICTION

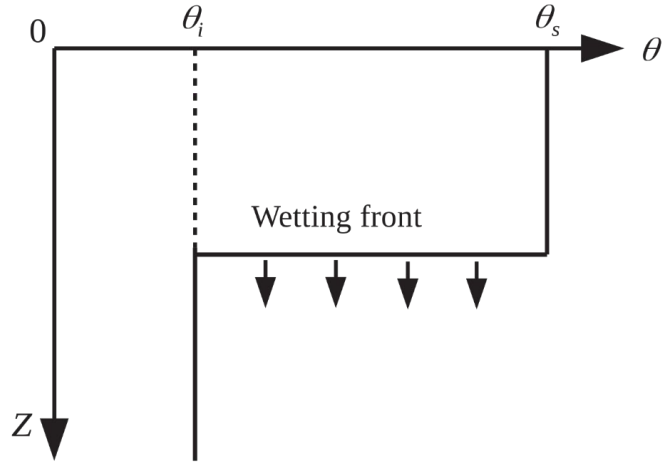
---

**Layered Green Ampt with Redistribution (LGAR): an approximation of the Richardson / Richards' equation**

*Peter La Follette, Keith Jennings, Ahmad Jan,  
Rachel McDaniel, Scott Peckham, Trey Flowers,  
Fred Ogden*

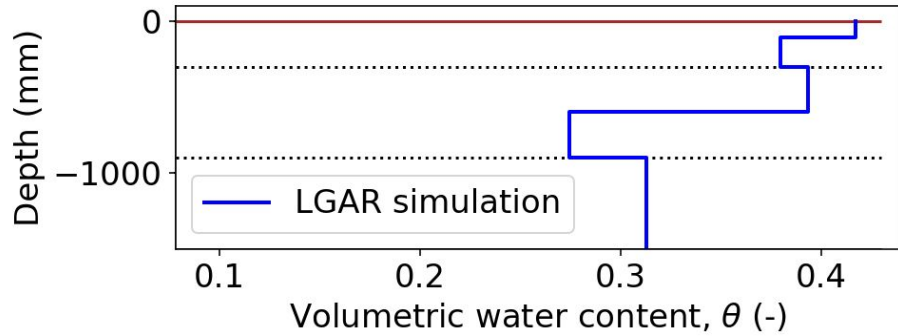


# Green - Ampt like models



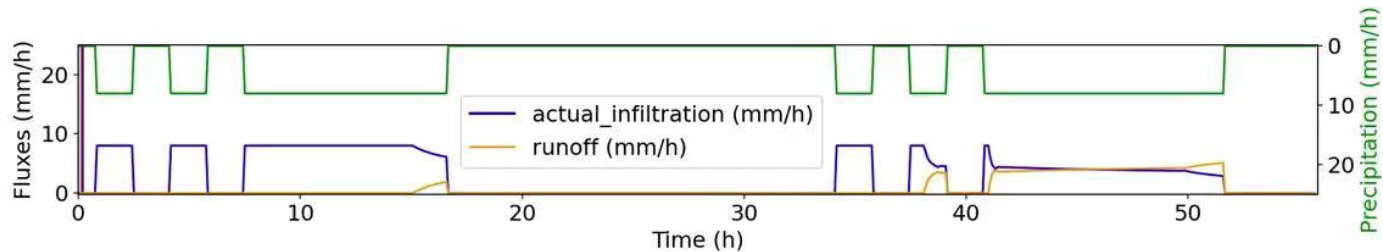
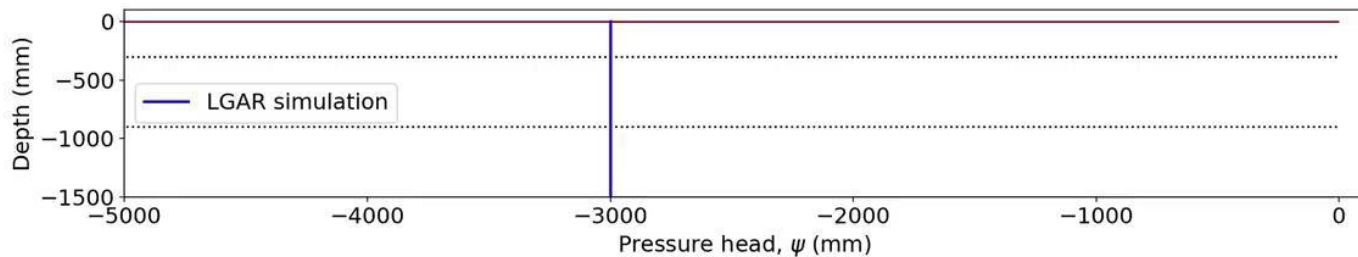
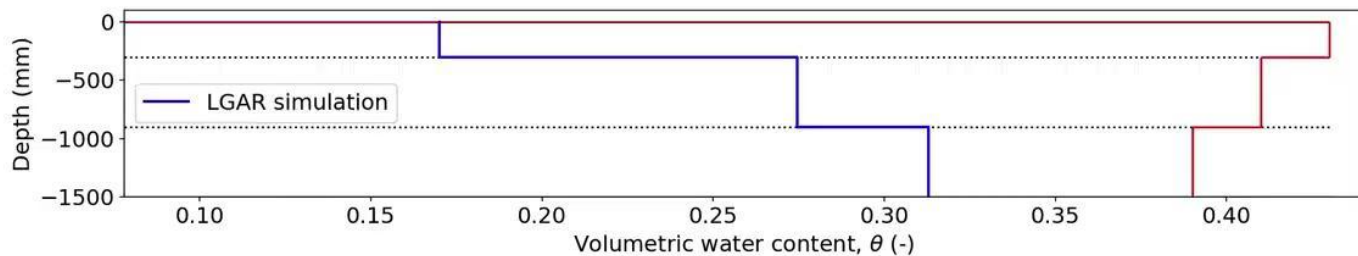
- models based on the GA concept simulate the motion of wetting fronts based on:
  - capillary suction
  - hydraulic conductivity

# LGAR allows wetting fronts to propagate between soil layers

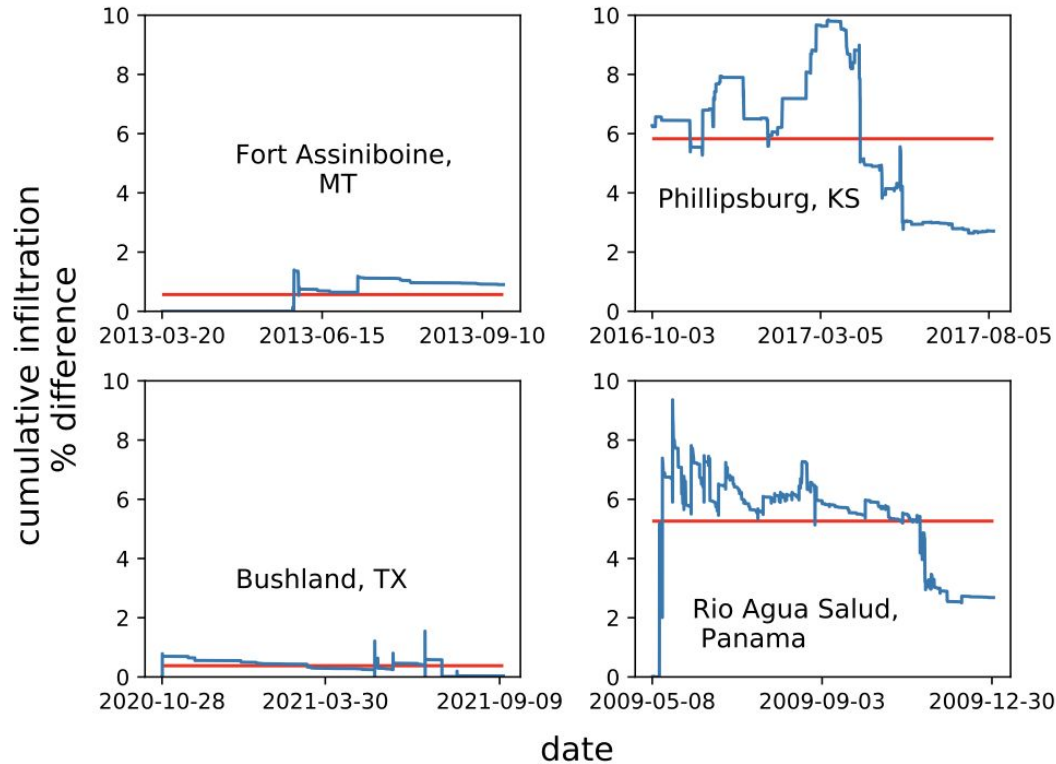


- models based on the GA concept simulate the motion of wetting fronts based on:
  - capillary suction
  - hydraulic conductivity
- LGAR allows wetting front propagation between soil layers

# LGAR video



# LGAR results match Richardson equation results



- Cumulative infiltration difference between LGAR and the Richards' / Richardson equation is on average less than 6%

# Computational advantage achieved

---

- faster than Richardson equation
  - rigorous speed comparisons are planned, preliminarily LGAR is usually several times faster than Richardson equation
- inherently stable and mass conservative
- increased speed with C conversion





OWP | OFFICE OF  
WATER  
PREDICTION



*Thank You!*



Peter La Follette



[peter.lafollette@noaa.gov](mailto:peter.lafollette@noaa.gov)



<https://water.noaa.gov>