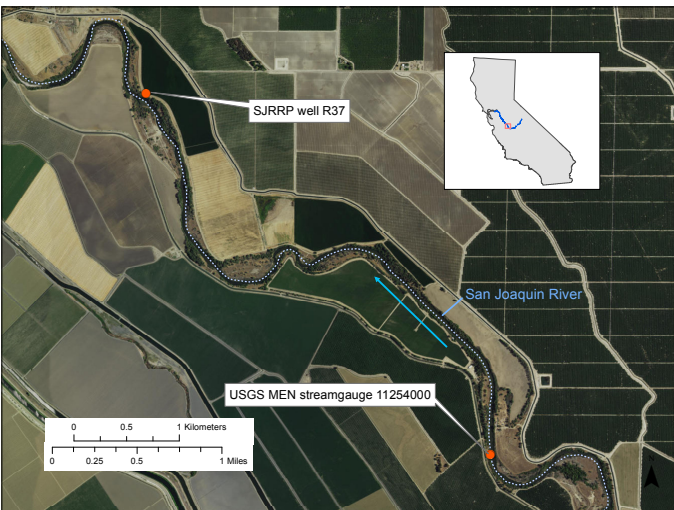
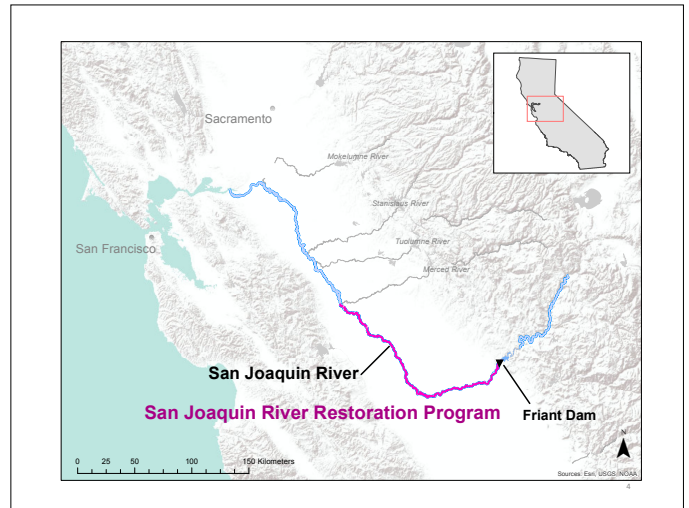
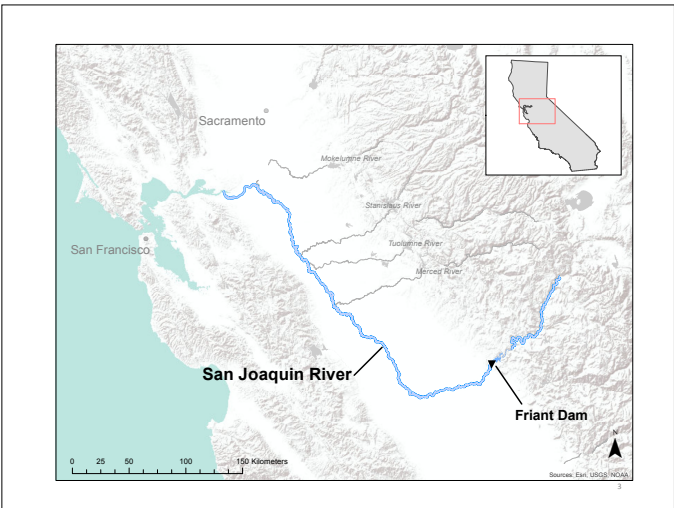
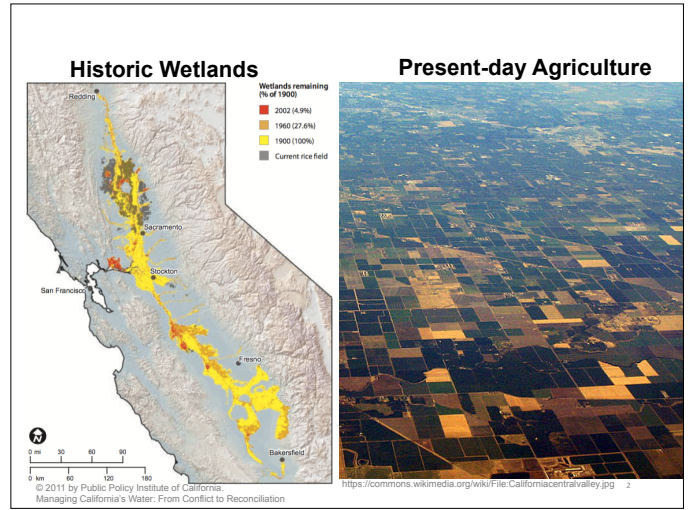


Informing Restoration Practice Through Estimation of Groundwater-Surface Water Time Lags With Windowed Cross-Correlation:

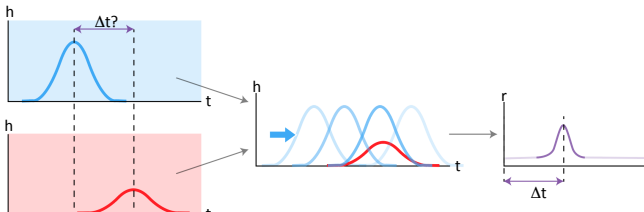
Recharge from Restoration Flows

Jenny Ta, Joshua H. Viers, Thomas Harmon
School of Engineering

June 30, 2016



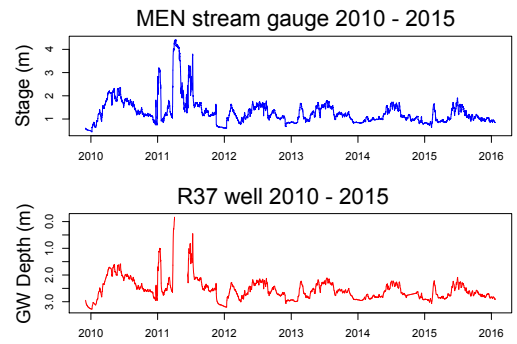
Methods: windowed cross-correlation



(Boker et al. 2002)

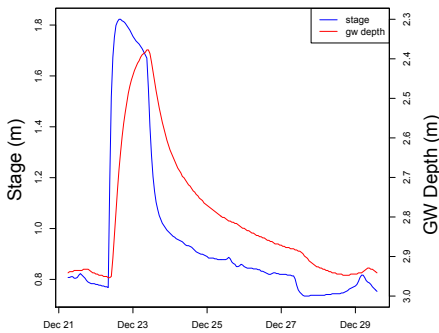
7

Methods: time series data



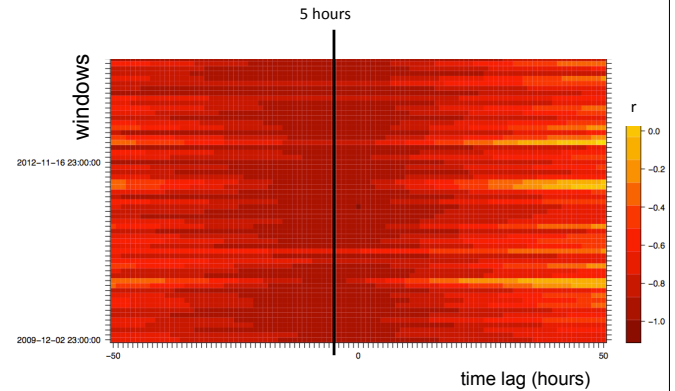
8

Methods: time series data



9

Cross-correlation matrix

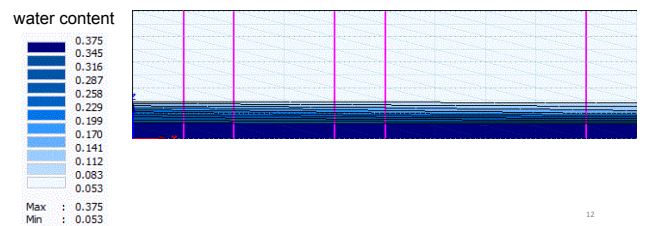
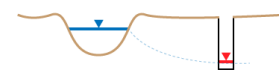


Questions

- What is driving time lag variation?
- Is time lag related to pulse type?
- What can time lag tell us about recharge rate?

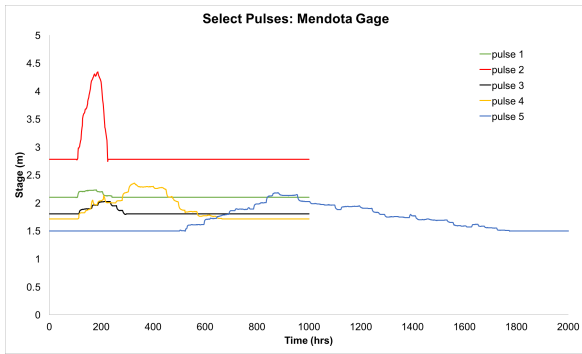
11

2D HYDRUS Model



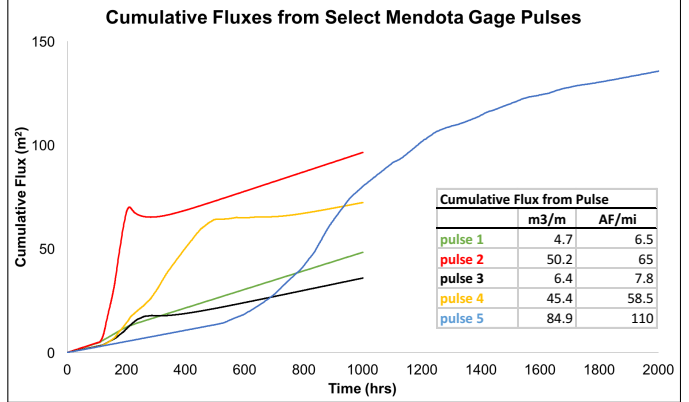
12

2D HYDRUS Model

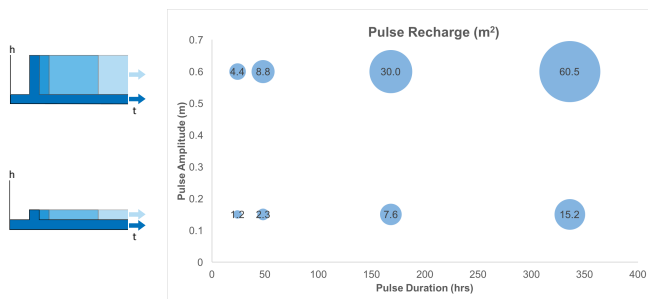


13

2D HYDRUS Model



Recharge from Test Pulses



15

Summary

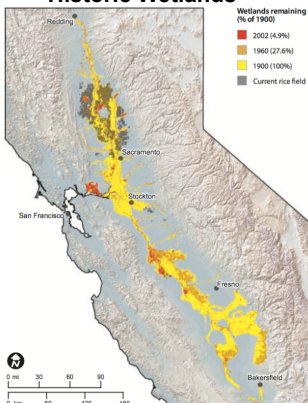
- Demonstrated use of windowed cross-correlations to estimate gw-sw time lags
- Pulse duration and amplitude effect on recharge scales linearly

Next Step

- Use simulations and test cases to investigate effect of pulse duration and amplitude on time lag
- Determine if time lags can be a proxy for recharge

16

Historic Wetlands



Present-day Agriculture



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<https://commons.wikimedia.org/wiki/File:Californiacentralvalley.jpg> 17

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18

“While writing is performed in isolation, it’s never a solitary act.”—Todd Henry