

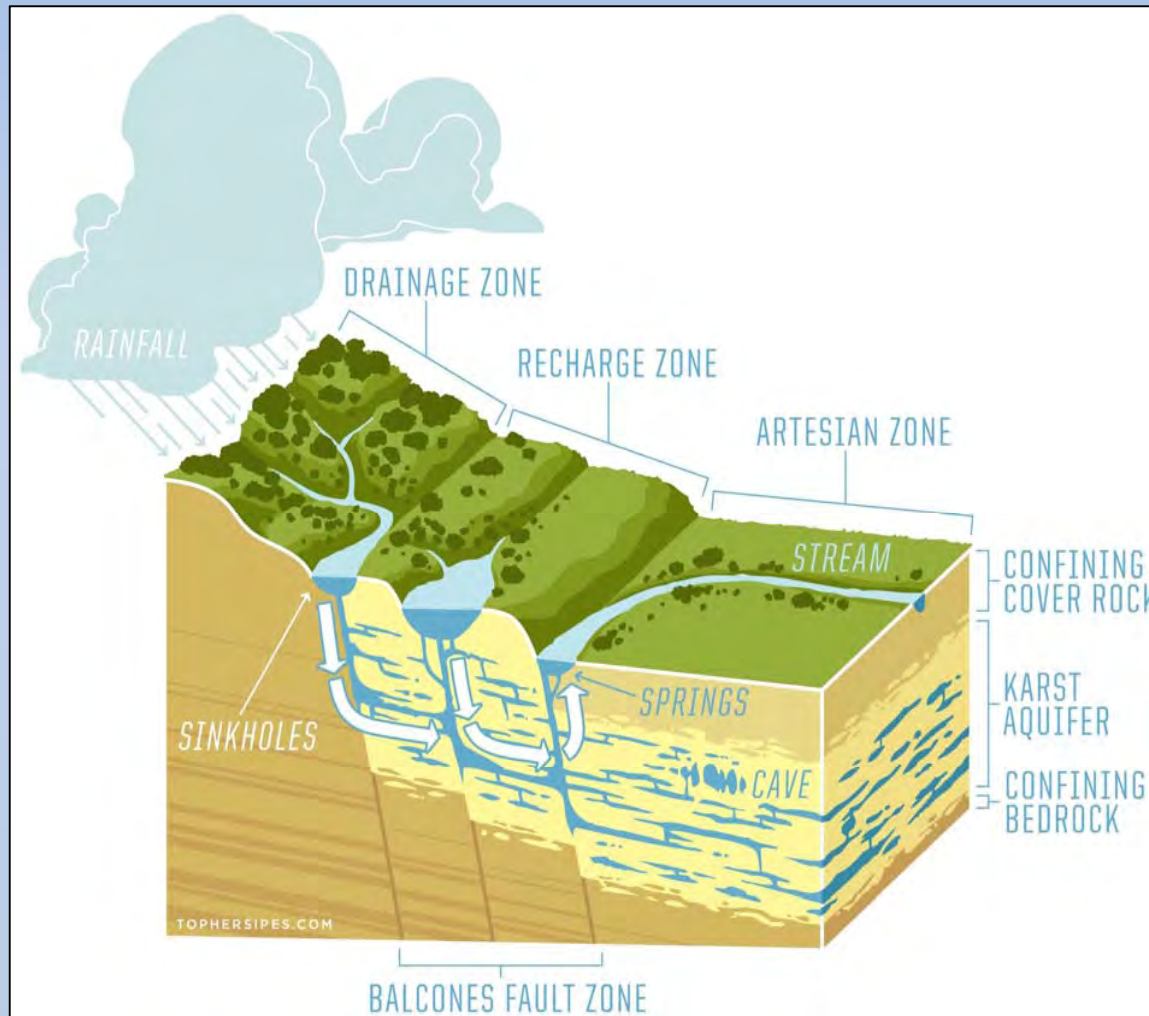
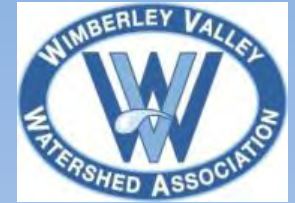
Cypress Creek & Blanco River Data Summary

David Baker

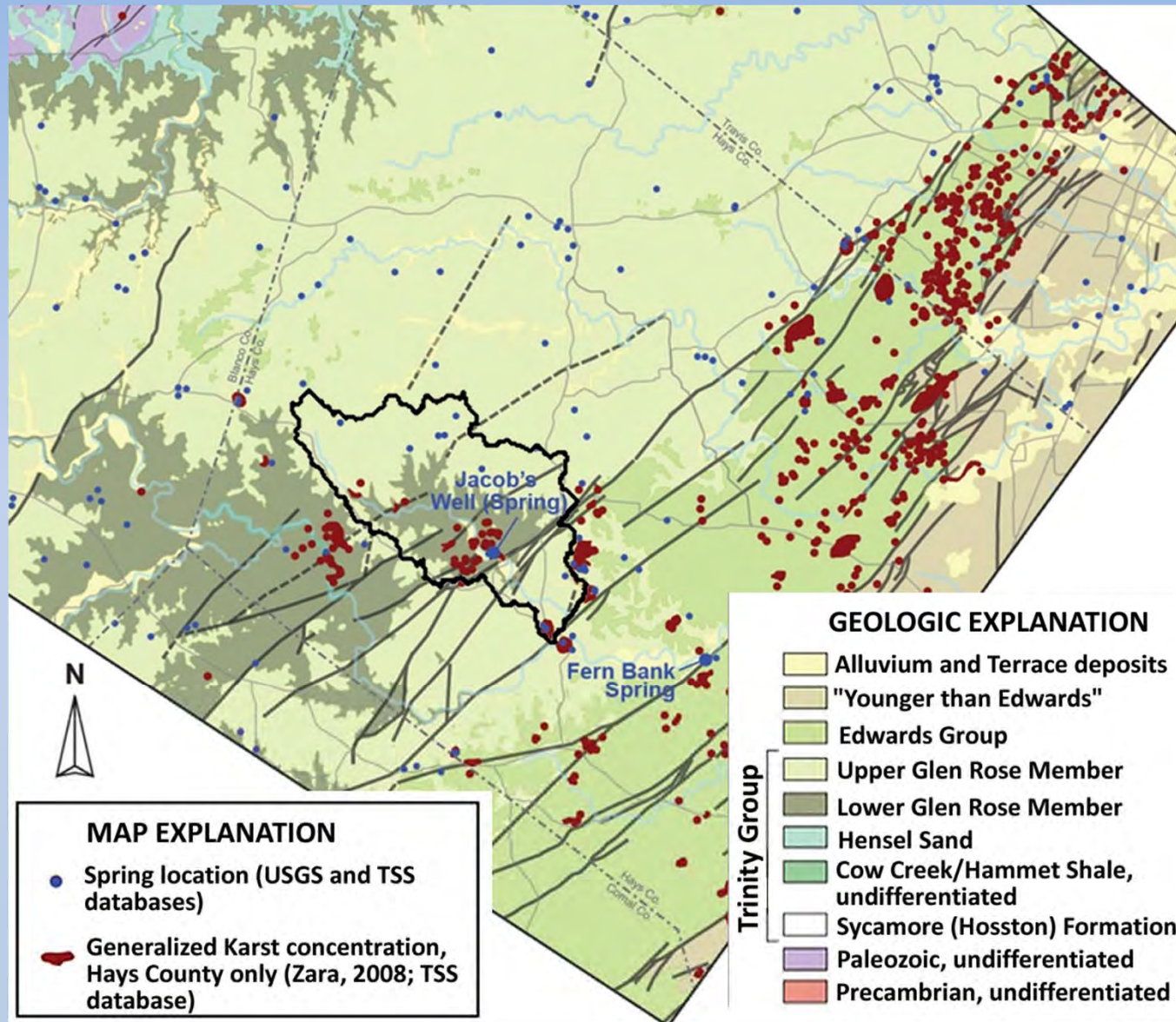
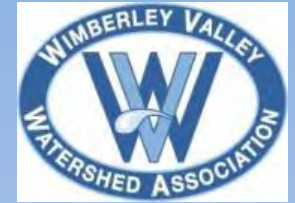
Wimberley Valley Watershed Association

March 24, 2012

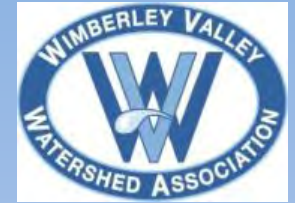
- Groundwater & surface water interactions are critical to water quality in Cypress Creek



Geologic Setting

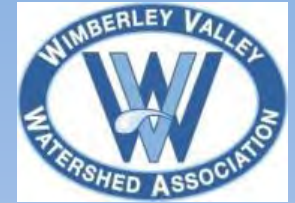


Source: HTGCD, 2010

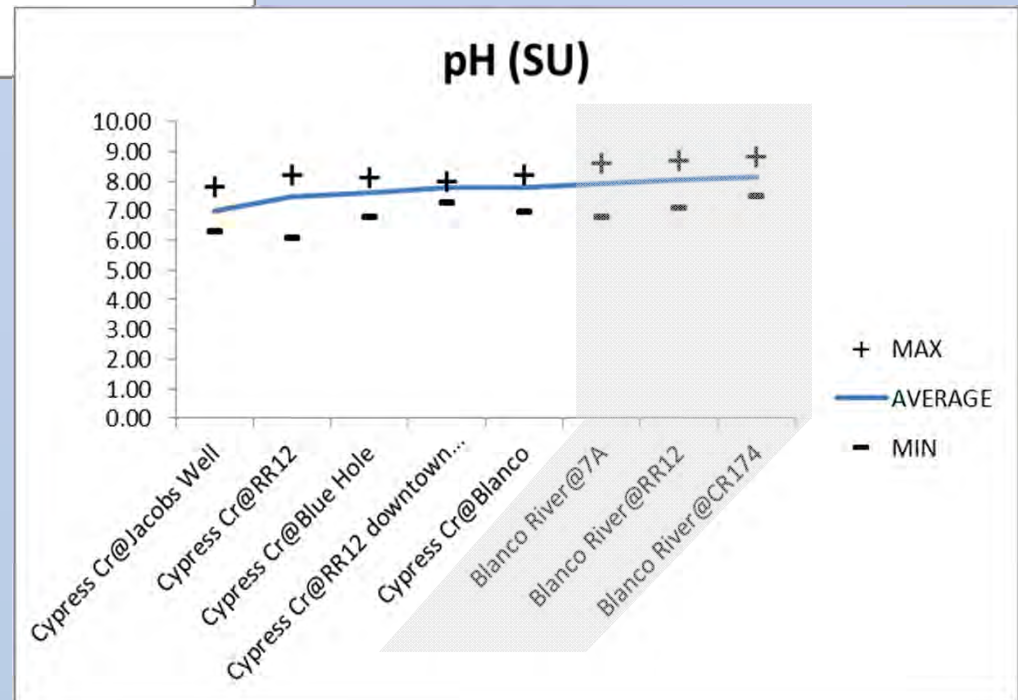
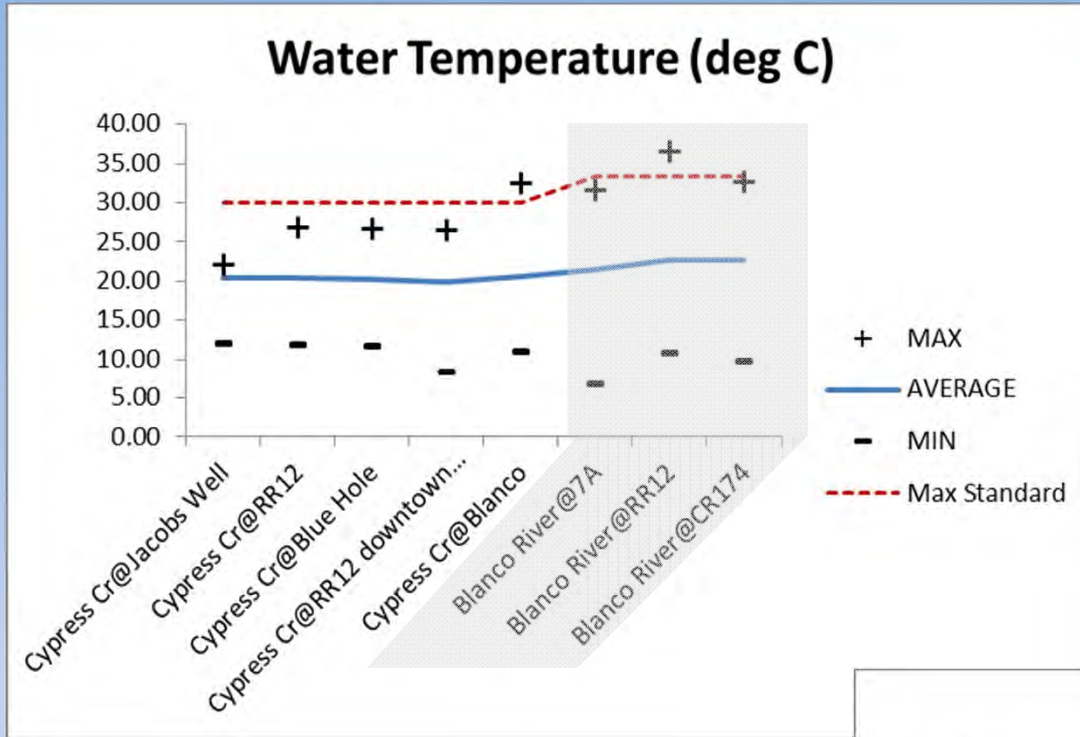


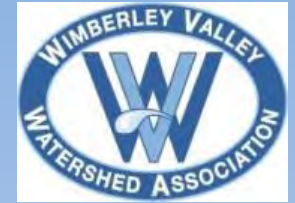
Summary of CRP Data

- Differences in data from the Cypress Creek to the Blanco River reflect their different sizes, flow patterns, and catchment areas.
- Water quality at Jacob's Well and Blue Hole strongly influenced by groundwater interactions
- Other sites show broader range of values and greater influence from surface conditions (runoff, weather, NPS pollution)
- Droughts of 2008-2009 and 2010-2011 had significant impact on water quality in the Wimberley Valley



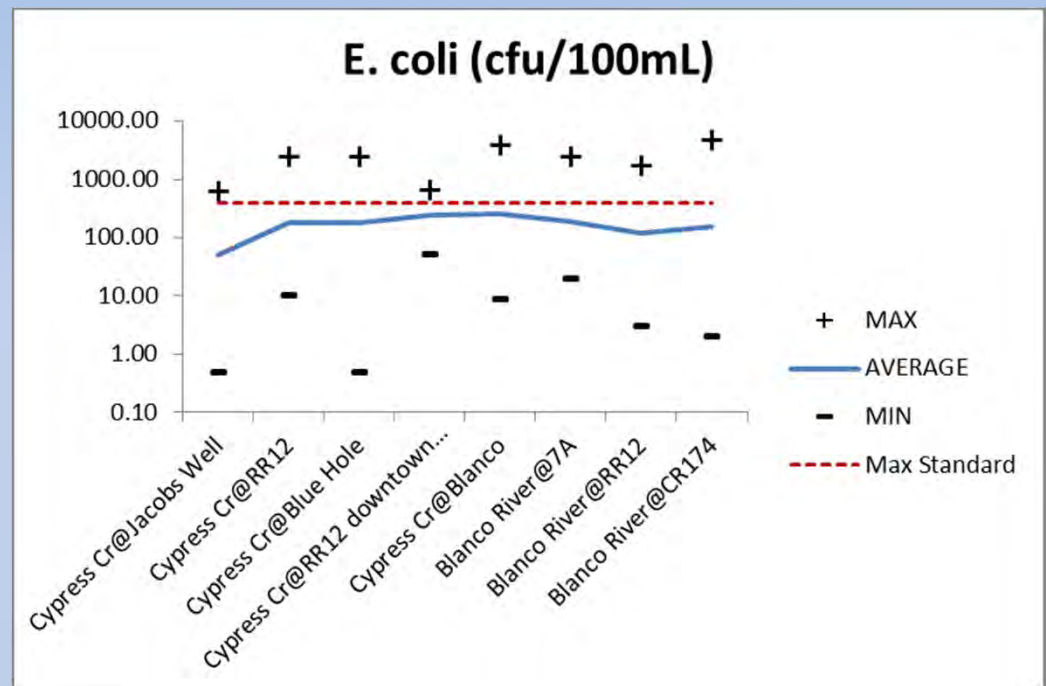
Upstream to Downstream Trends

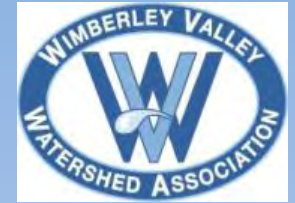




E. coli

- Average bacteria level rises as you travel downstream in the Cypress Creek:
 - 51 cfu/100mL at Jacob's Well
 - 262 cfu/100mL at the Blanco confluence
- All sites have *E. coli* grab samples above the standard
- Maximum readings:
 - 3830 cfu/100mL in the Cypress Creek-Blanco confluence (Aug 2011)
 - 4800 cfu/100m in the Blanco River downstream from Wimberley (Mar 2006)

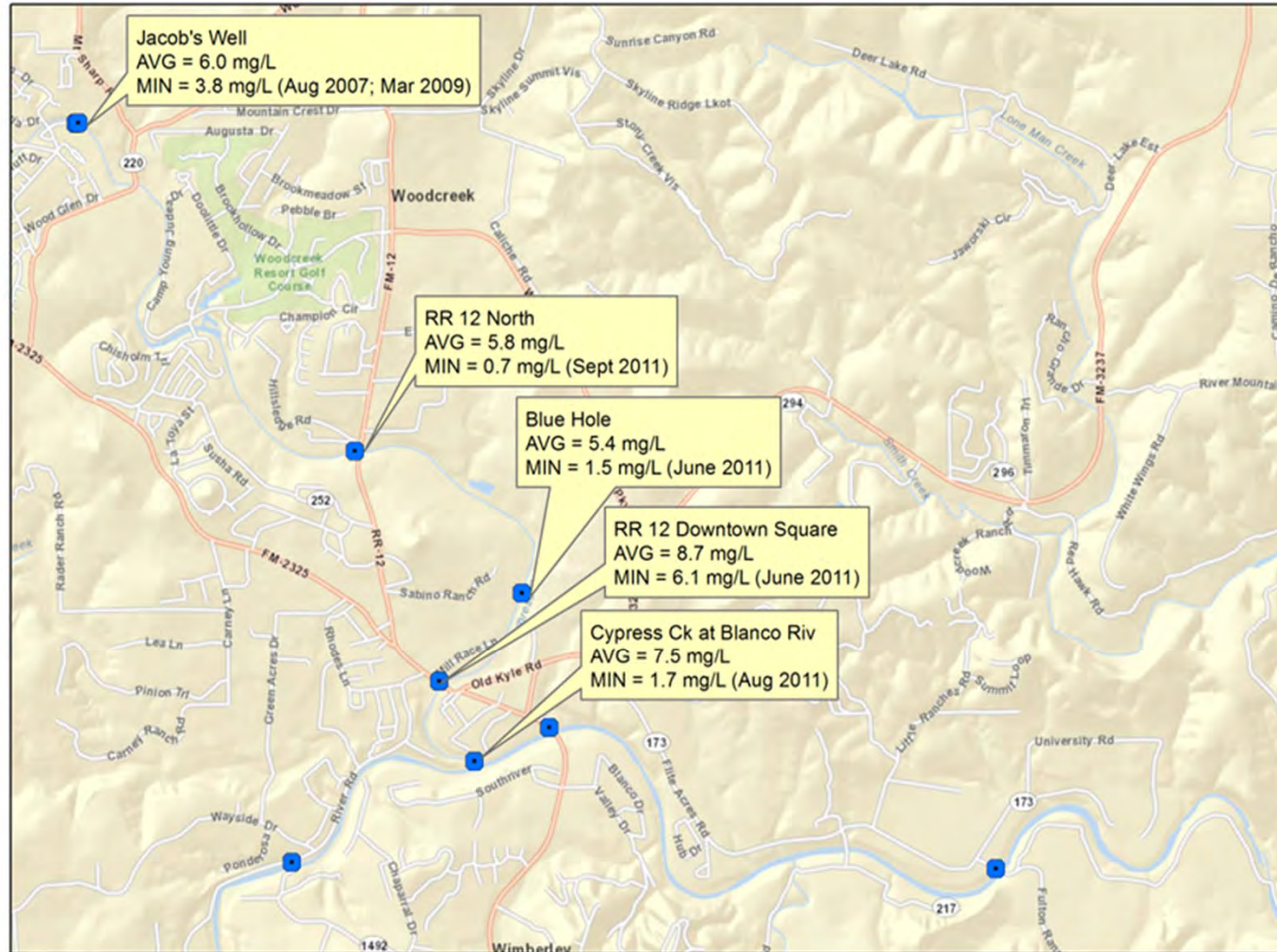


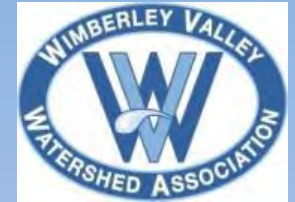


Dissolved Oxygen

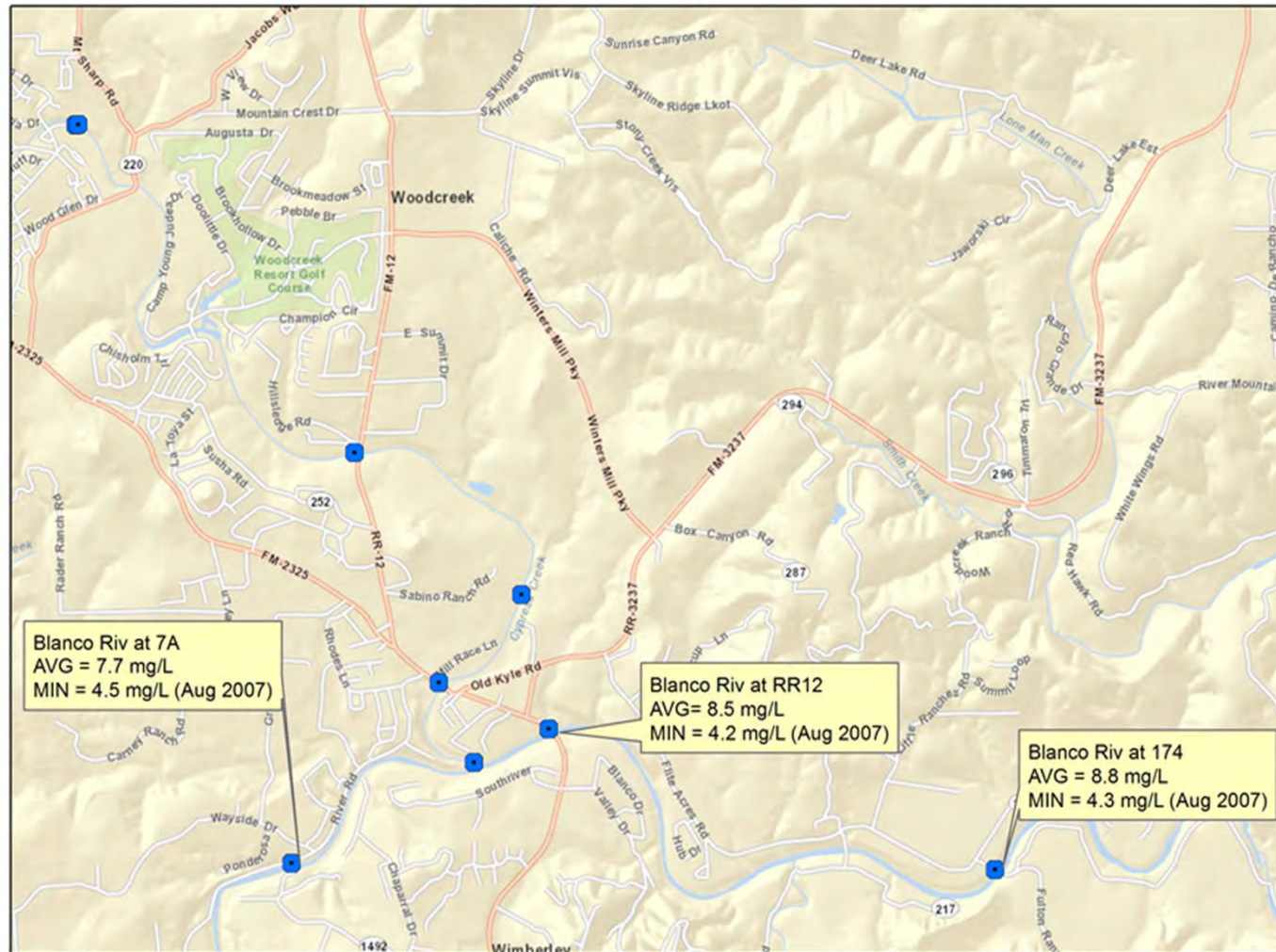
- DO rises on average as you travel downstream in Cypress Creek
- Relatively constant at Jacob's Well (average = 6.0 mg/L, standard dev = 1.2 mg/L)
- For Cypress Creek, summer of 2011 caused record low DO readings at 4 downstream sites
- At Jacob's Well and on Blanco River, lowest recorded DO was in Aug 2007

Trends in Dissolved Oxygen Cypress Creek

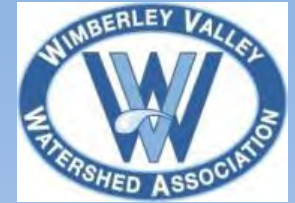




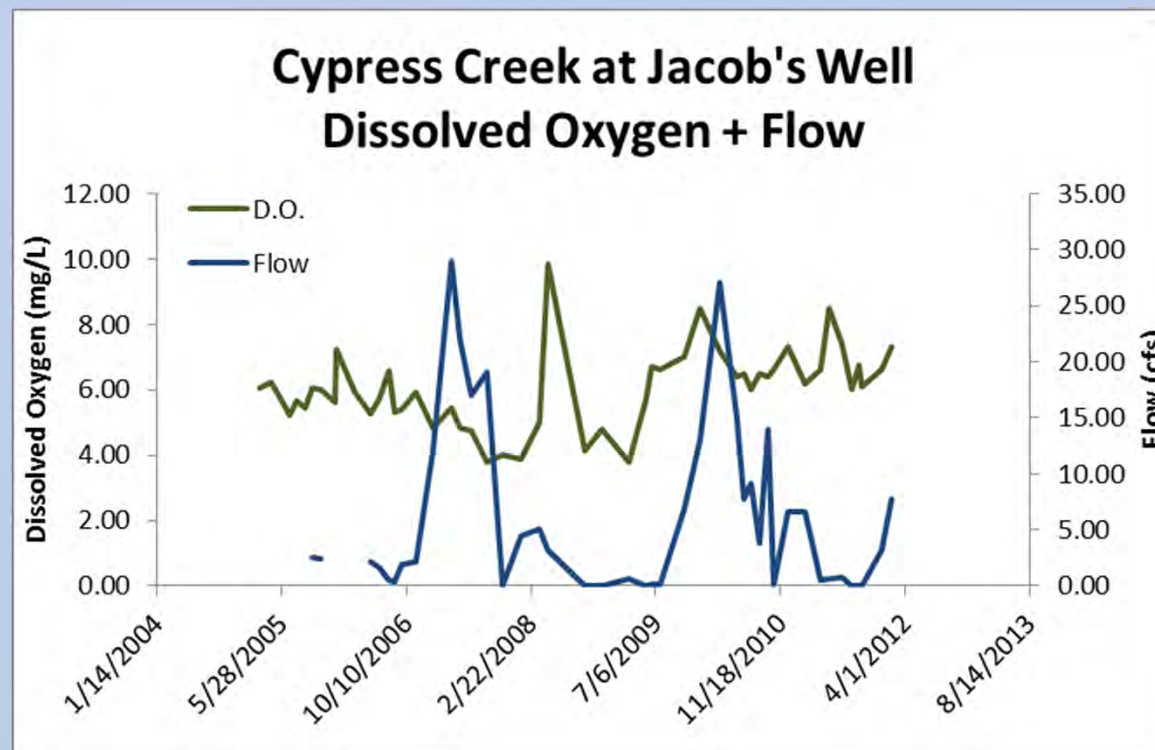
Trends in Dissolved Oxygen Blanco River



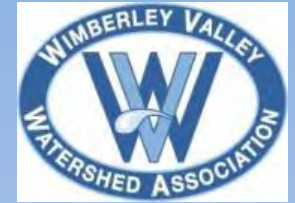
Dissolved Oxygen and Flow



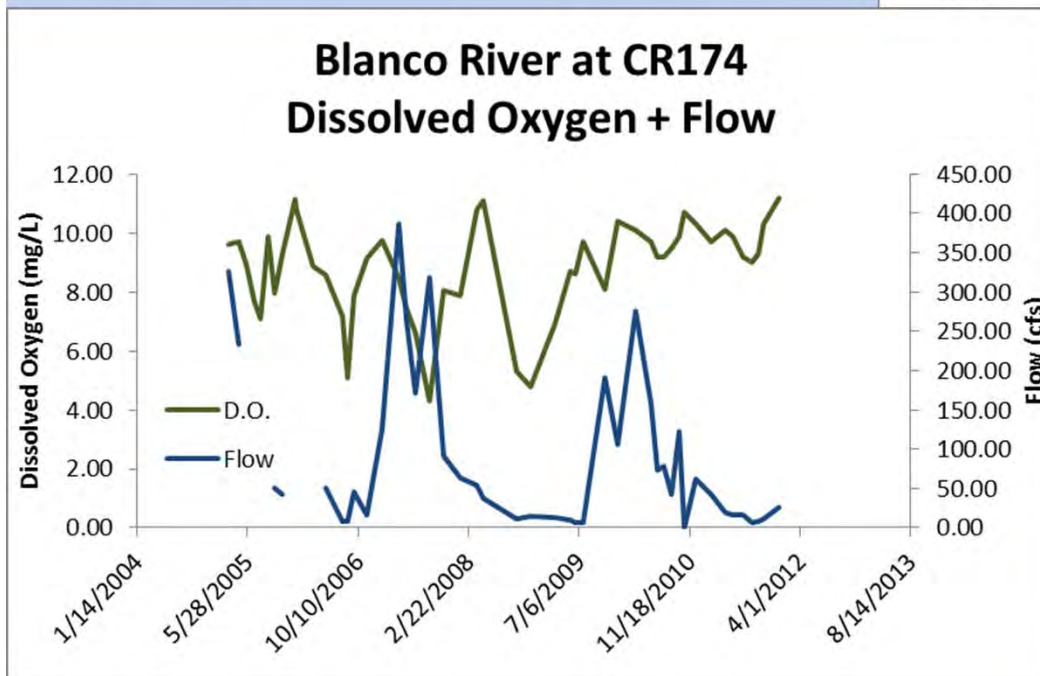
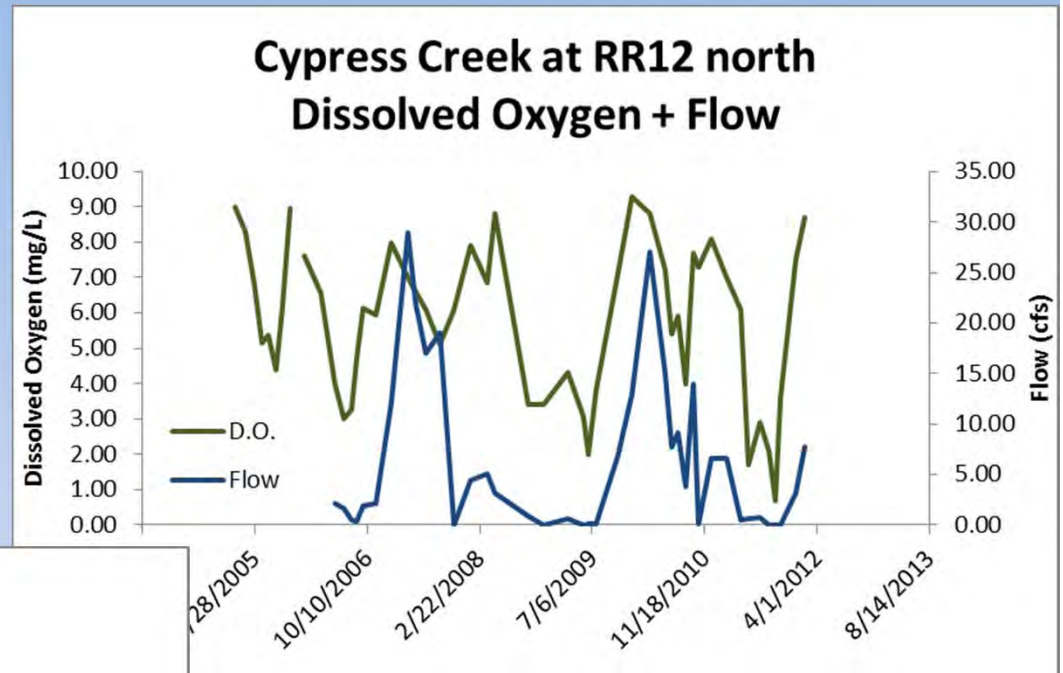
- Dissolved oxygen at Jacob's Well not as sensitive to flow
- Relatively constant (average 6.0 mg/L) DO from groundwater input



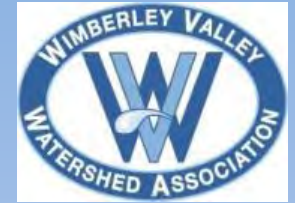
Dissolved Oxygen and Flow



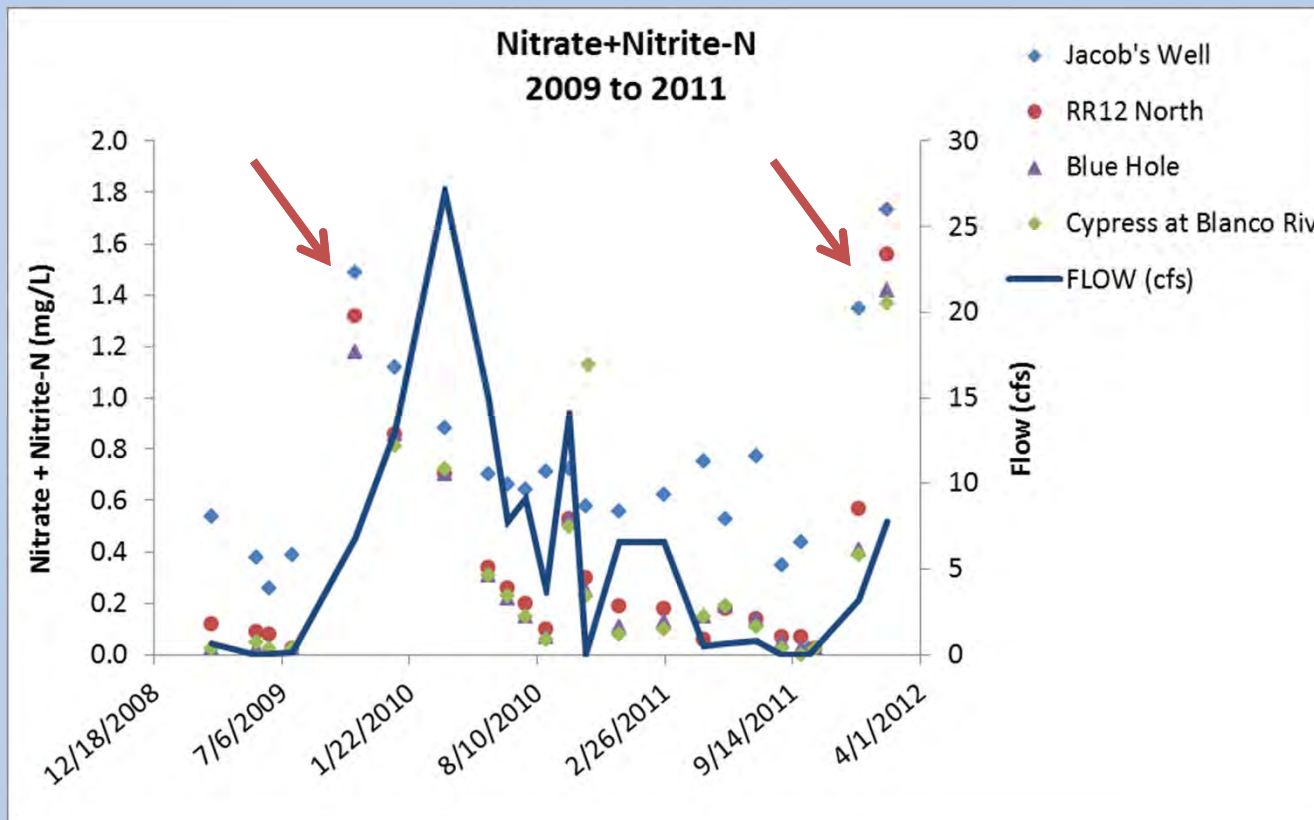
- Other sites show strong influence of flow on DO, both Cypress Creek and Blanco River

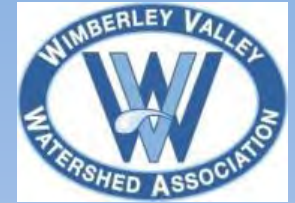


NPS pollution - Nitrogen



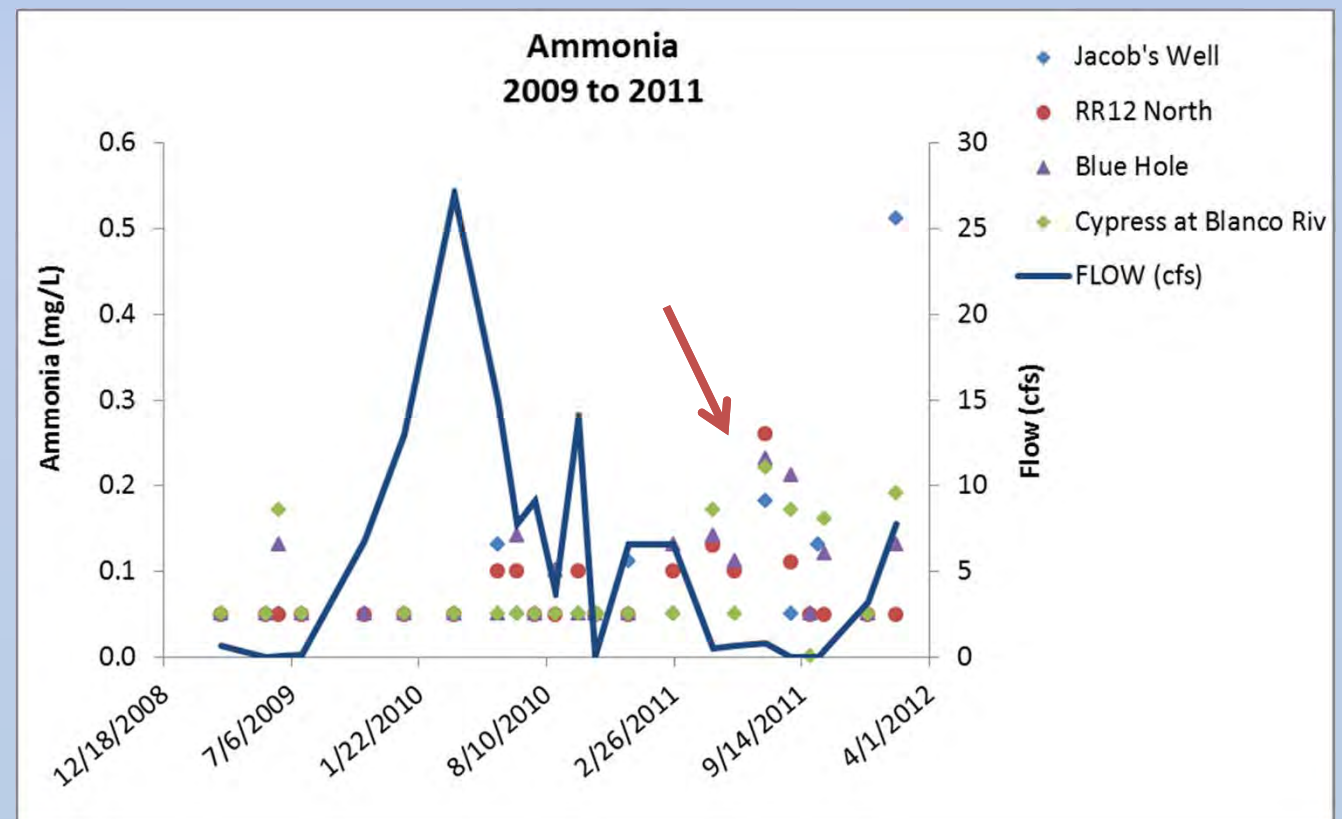
- Rising flow following extended dry periods in 2009 and 2011 caused very high peaks in nitrogen at all sites in Cypress Creek.
- Blanco River sites show the same pattern, too.

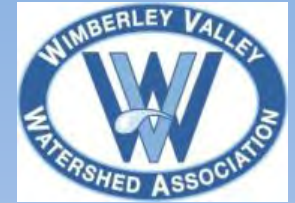




NPS pollution - Ammonia

- On the contrary, higher than normal ammonia observed during extended dry period in 2011
- Record high ammonia recorded at Jacob's Well in Feb 2012





Summary

- Dissolved oxygen remains a critical issue when flow is reduced; record low levels observed in summer 2011
- *E. coli* levels occasionally very high, but in general observations have been lower in 2009-11 than in 2005-08
- Data show that nitrogen is built up during extended dry periods and spikes after rainfall
- Ammonia peaks during extended dry periods, suggesting a source close to the river (wildlife or septic systems)
- At all sites (Blanco and Cypress), ammonia readings have been much higher in 2009-11 (avg 0.09 mg/L) versus 2005-08 (0.03 mg/L)