

# Item 7a

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WHAT STARTS HERE CHANGES THE WORLD

(A Preliminary Assessment of the)

## Effectiveness of Stormwater Regulations in the Barton Springs Zone

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## Barton Springs

- Known location of 2 endangered species
- Long term monitoring record
- Integrates the water quality impacts of the entire zone

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### Population Growth in BSZ

- 1990 – 2010 population grew by 2.5x (+80,000 people)
- 2100 acres of structures added (not including driveways, sidewalks, or roads) according to Herrington
- 1400 acres of new IC just in Williamson Ck. Watershed (Sung et al., 2013)

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### Water Quality Regulations

- Austin SOS Ordinance in place since 1992
  - Basically a no-discharge requirement
  - Retention/Irrigation
- TCEQ current Edwards Rules in place since 1999
  - 80% TSS reduction
  - Mostly sand filters

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### Total Suspended Solids

Y-axis: TSS (mg/L)

X-axis: Date (from 1/31/93 to 12/27/14)

Regression Equation:  $y = -0.0003x + 12.87$

$R^2 = 0.0294$

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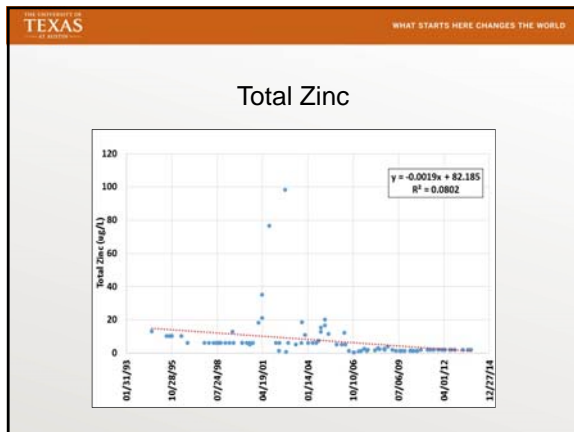
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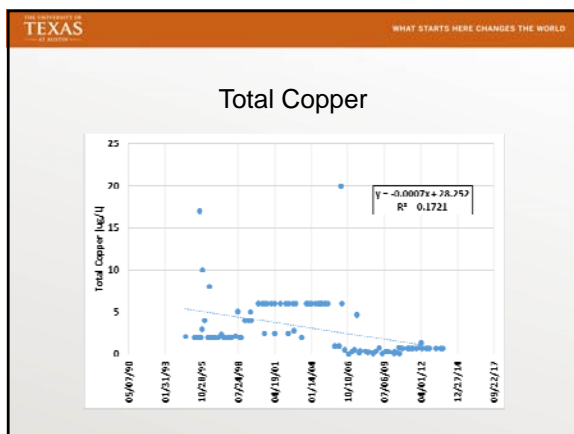
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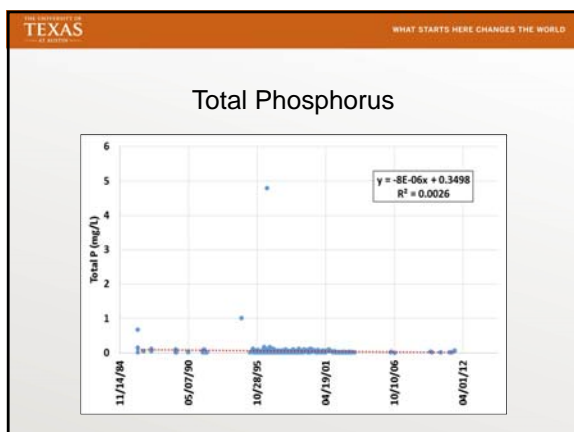
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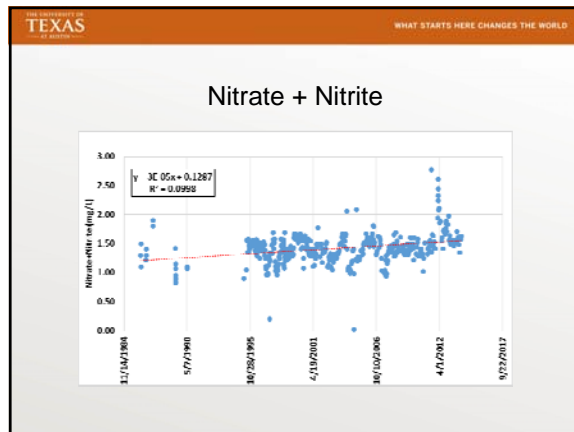
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### Stormwater Nitrogen Source?

BMP	Effluent Concentration (mg/L)
Retention/Irrigation	1.05
Sand Filter	0.96
Permeable Friction Course	1.04
Rain Garden	0.89

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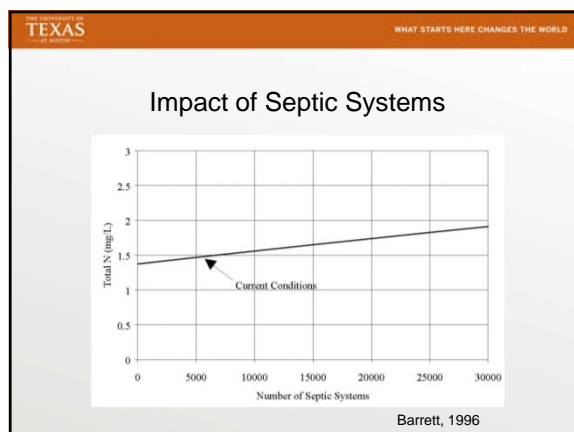
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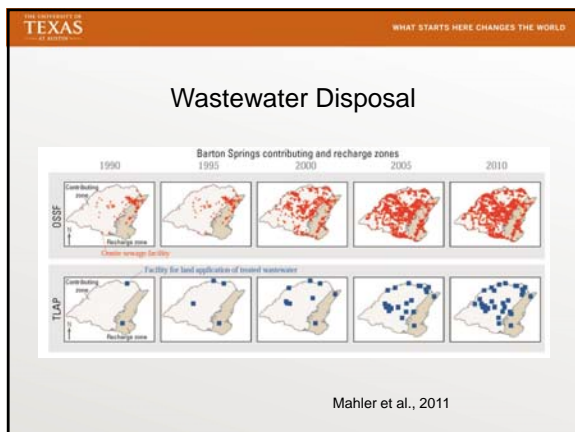
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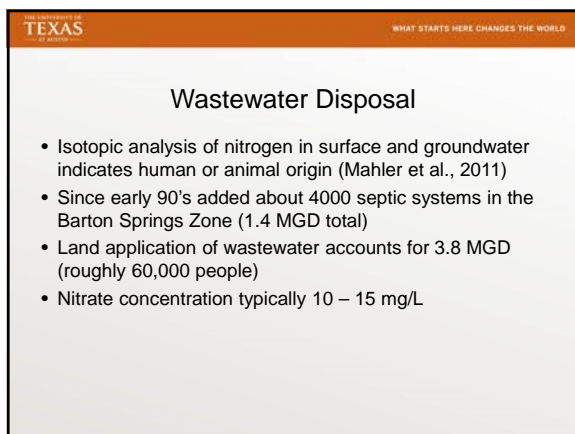
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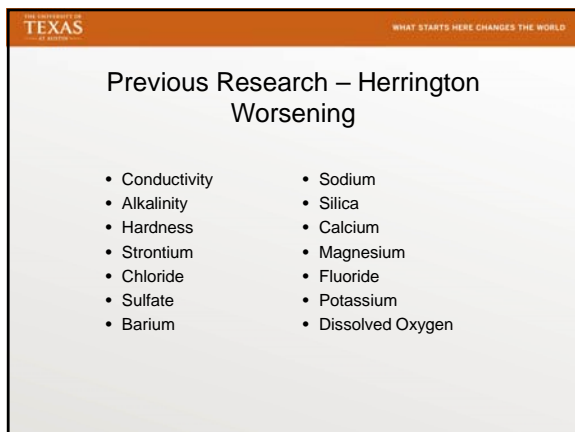
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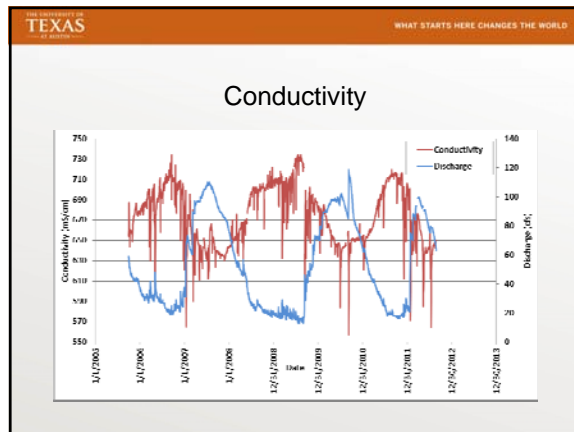
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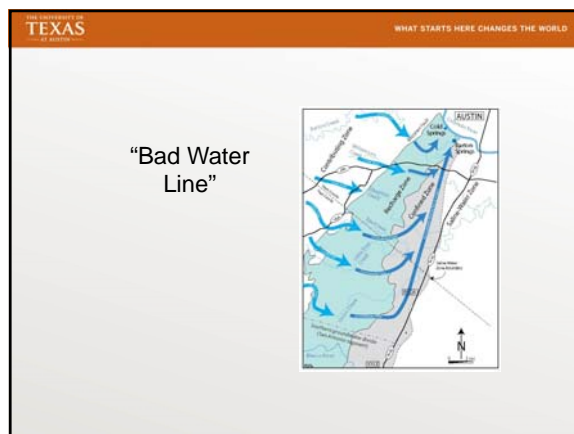
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- ### Previous Research – Herrington Worsening
- Conductivity
  - Alkalinity
  - Hardness
  - Strontium
  - Chloride
  - Sulfate
  - Barium
  - Sodium
  - Silica
  - Calcium
  - Magnesium
  - Fluoride
  - Potassium
  - Dissolved Oxygen
  - Nitrate+Nitrite

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## Previous Research – Herrington

### No Trend

- Total suspended solids
- Total volatile solids
- Zinc
- Copper
- Lead
- Cadmium
- Dissolved phosphorus
- Total phosphorus
- Diazinon
- Atrazine
- Oil and Grease
- Turbidity
- E. coli

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## Conclusions

- Concentrations of urban runoff constituents in spring discharge are stable
- Stormwater controls have been effective at preventing degradation from stormwater
- Prevention of further degradation requires:
  - Limiting pumping
  - Limiting wastewater discharges or enhancing nitrogen removal

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## THE END

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