Atrazine: Hero or Hero to Heroine?

Presented to:

Texas Water Quality Connection

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Watershed Protection and
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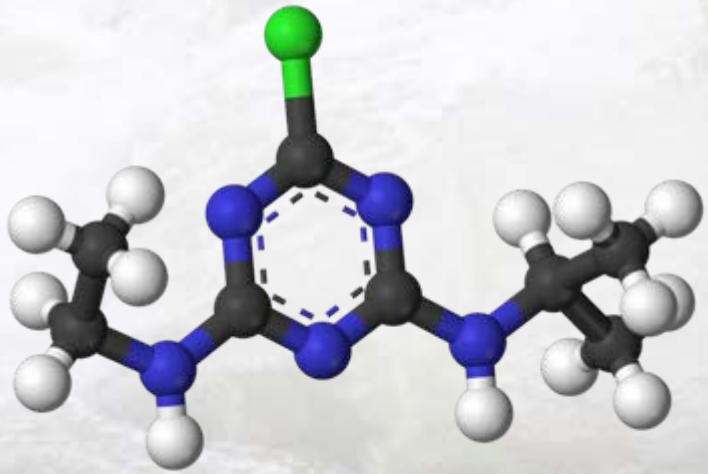
Atrazine

- Triazine herbicide
- Inhibits electron transport
- Homeowner and farmer use

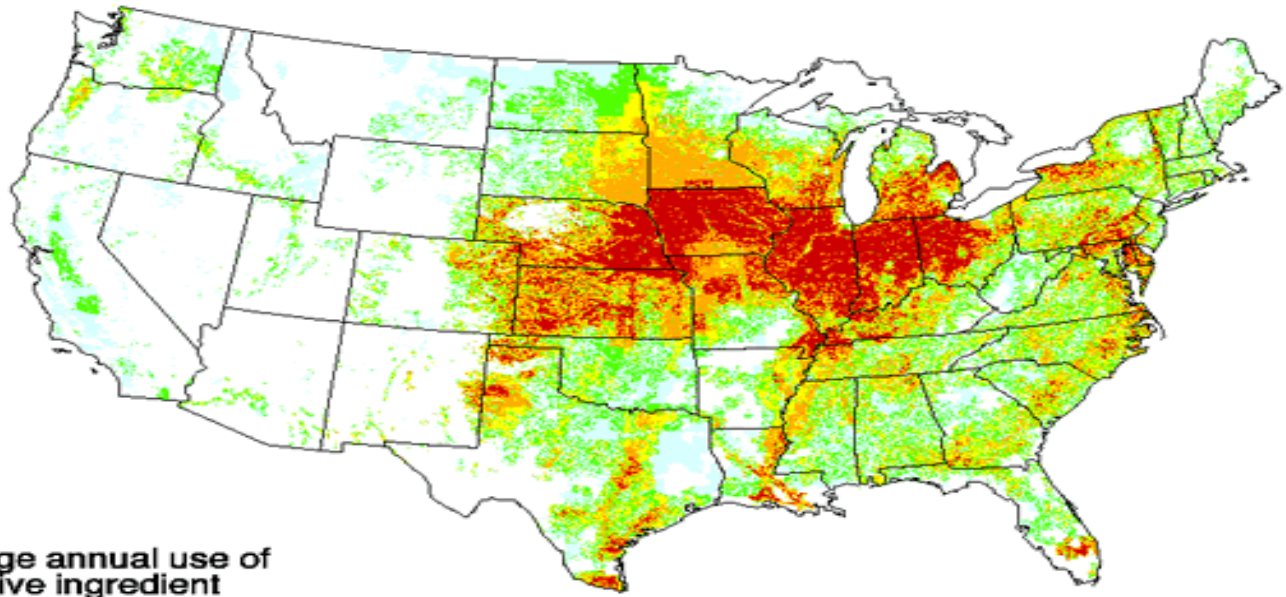


$C_8H_{14}ClN_5$

Usage

ATRAZINE - herbicide

1997 estimated annual agricultural use



Average annual use of active ingredient
(pounds per square mile of agricultural land in county)

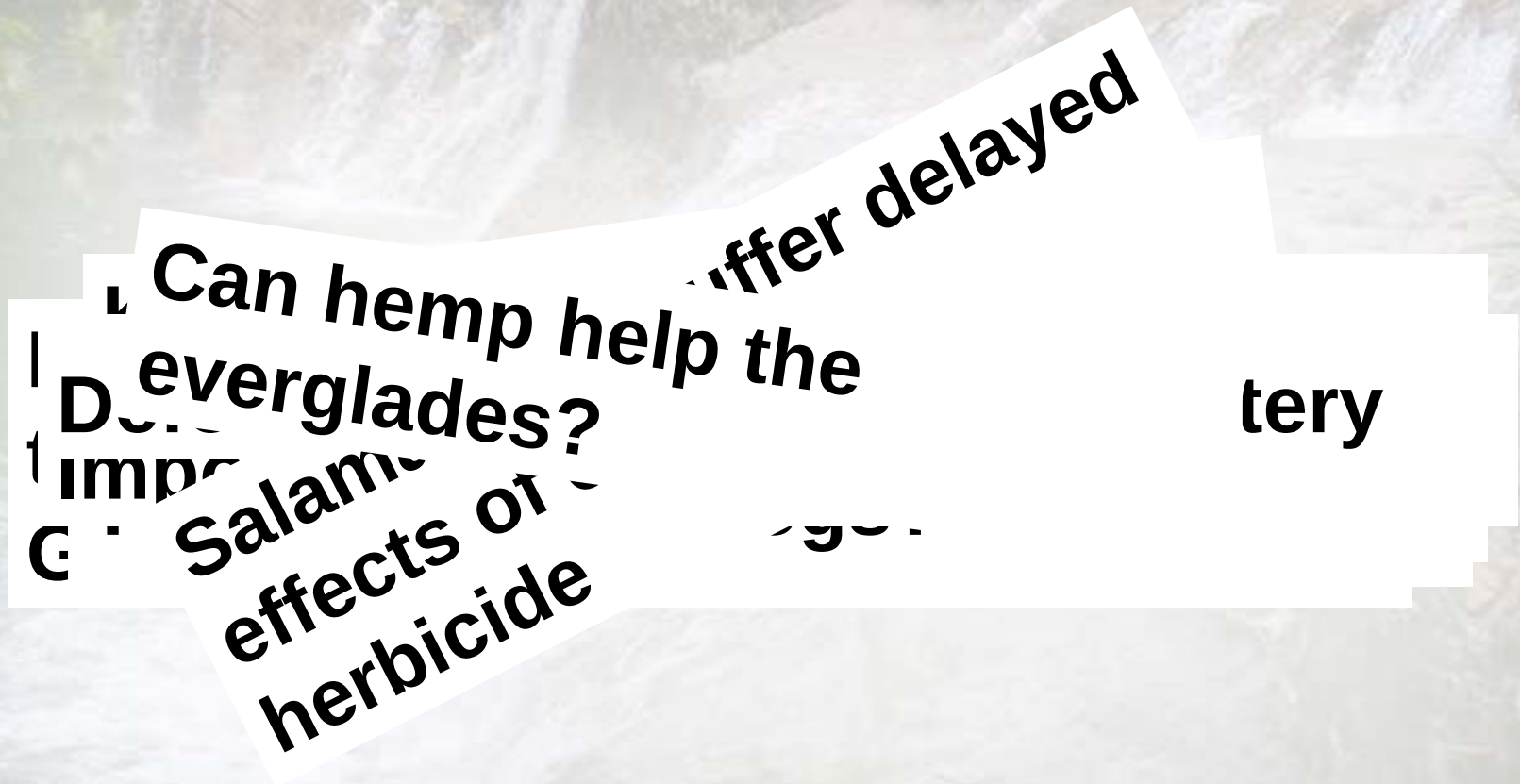
- no estimated use
- 0.001 to 0.358
- 0.359 to 2.151
- 2.152 to 9.855
- 9.856 to 32.77
- >= 32.771

Crops	Total pounds applied	Percent national use
corn	62, 381, 038	84. 00
sorghum	6, 750, 038	9. 09
summer fallow	2, 539, 169	3. 42
sugarcane	2, 203, 421	2. 97
sweet corn	340, 452	0. 46
sod harvested	30, 214	0. 04
other hay	13, 224	0. 02
seed crops	5, 833	0. 01

Usage

- >76,000,000 lbs sold in US annually
- 46,000 lbs sold in Austin annually to homeowners

Atrazine in the Press

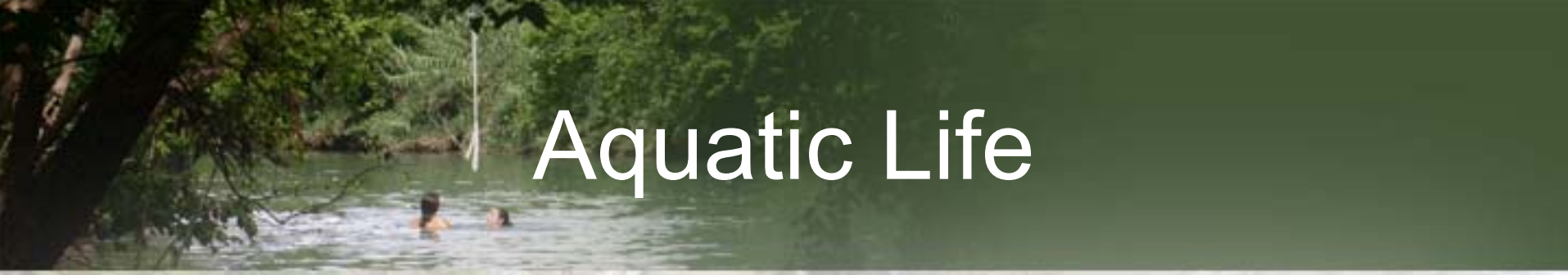


Persistence

- Microbial/chemical degradation
- Medium to high mobility (Koc ≈ 100 µg/g)
- Short half-life in soil (60 days)
- Long half-life in water (>6 months)

Human Health

- EPA Drinking water MCLG = 3 µg/L
- California public health goal = 0.15 µg/L
- Low bioconcentration potential
- Low exposure potential



Aquatic Life

- Low toxicity to fish and benthic macroinvertebrates
- Synergistic effects increase toxicity

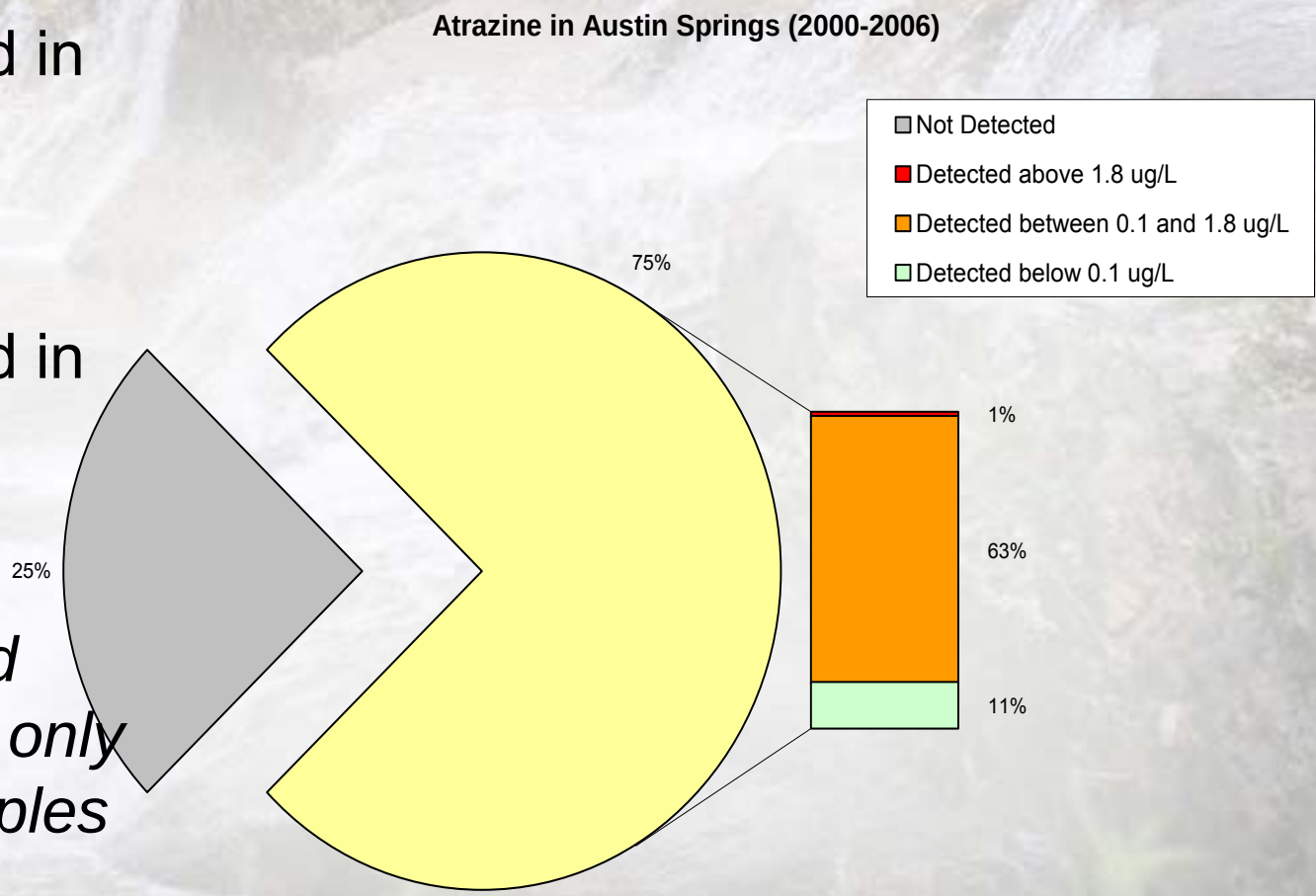
EPA acute = 1,500 µg/L

Canadian guideline = 1.8 µg/L

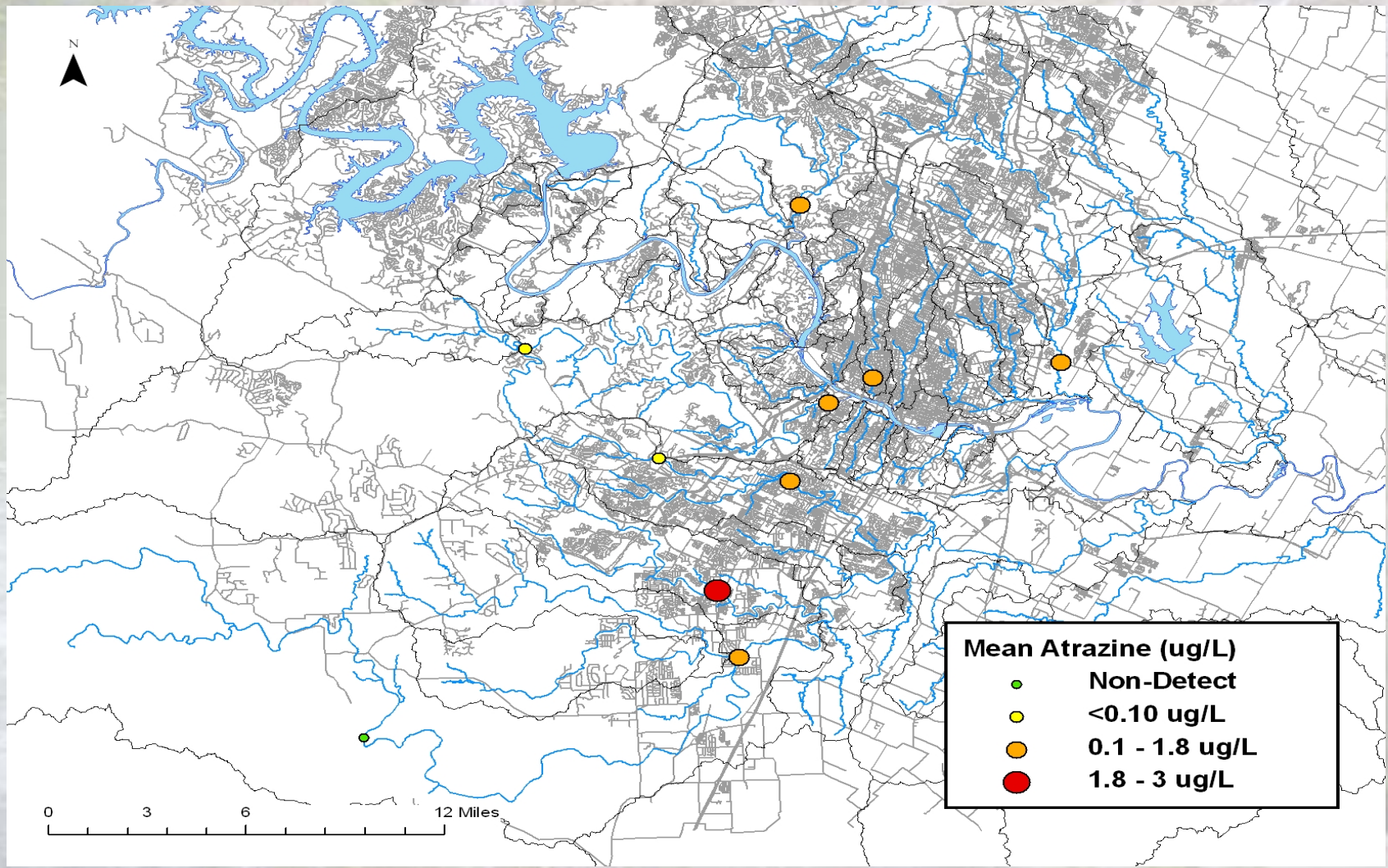
Lowest amphibian effect = 0.10 µg/L

Austin Groundwater

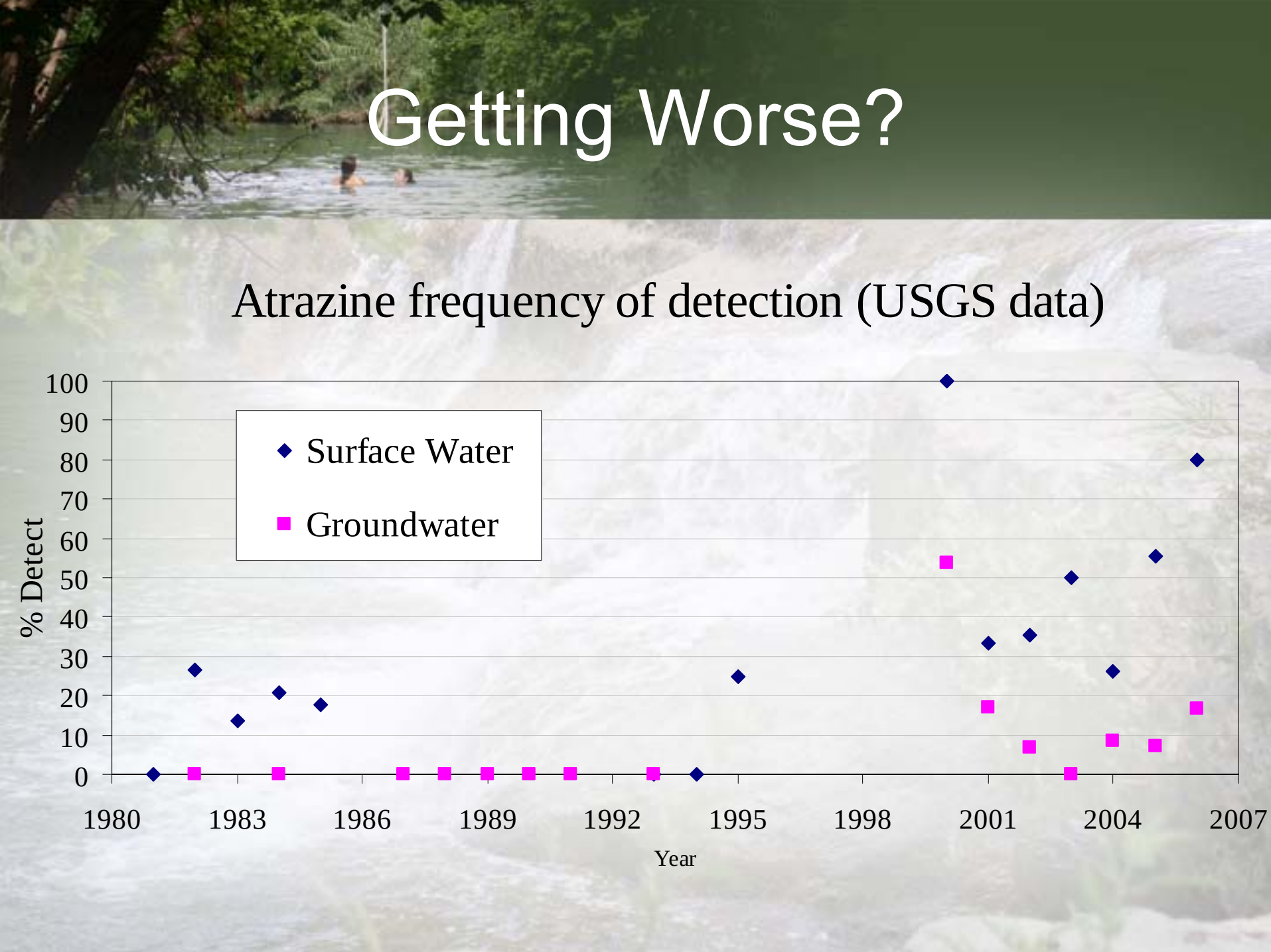
- Atrazine detected in 75% of spring samples
- Atrazine detected in Barton Springs in 83% of samples
- *Atrazine detected above 1.8 µg/L in only 1% of spring samples*



Austin Surface Water

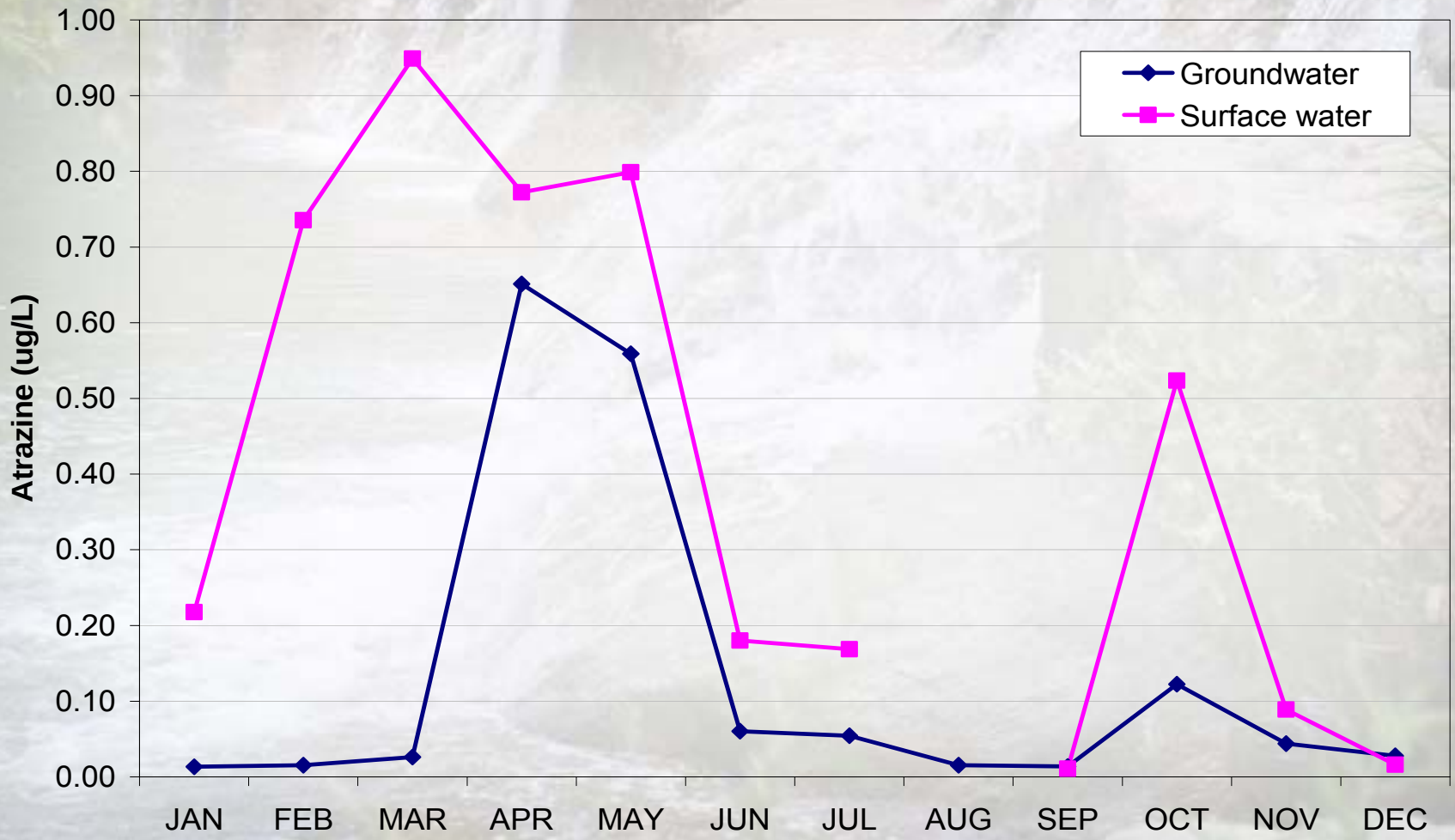


Getting Worse?

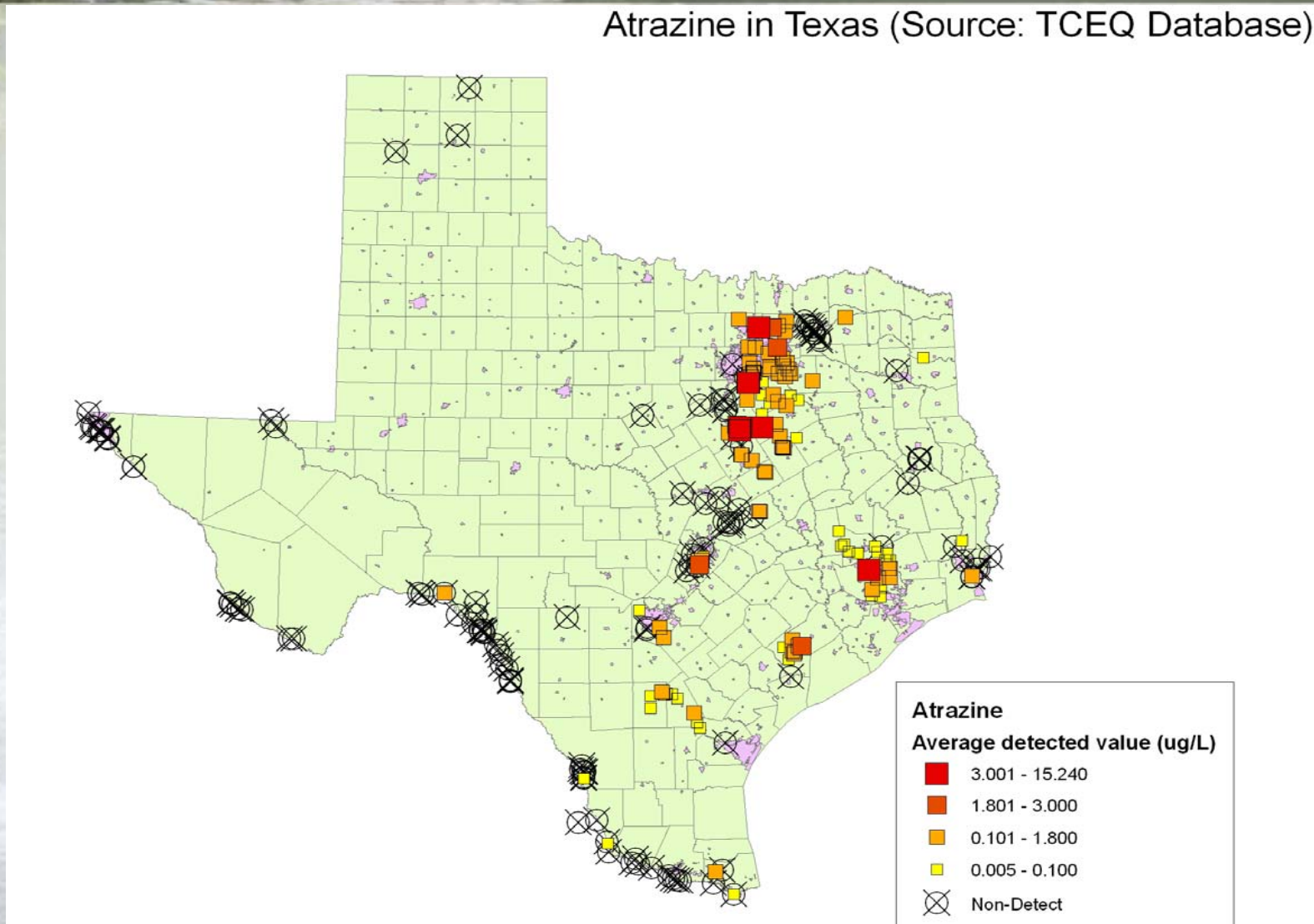


Seasonal Component

Average atrazine in Austin surface water sites and springs



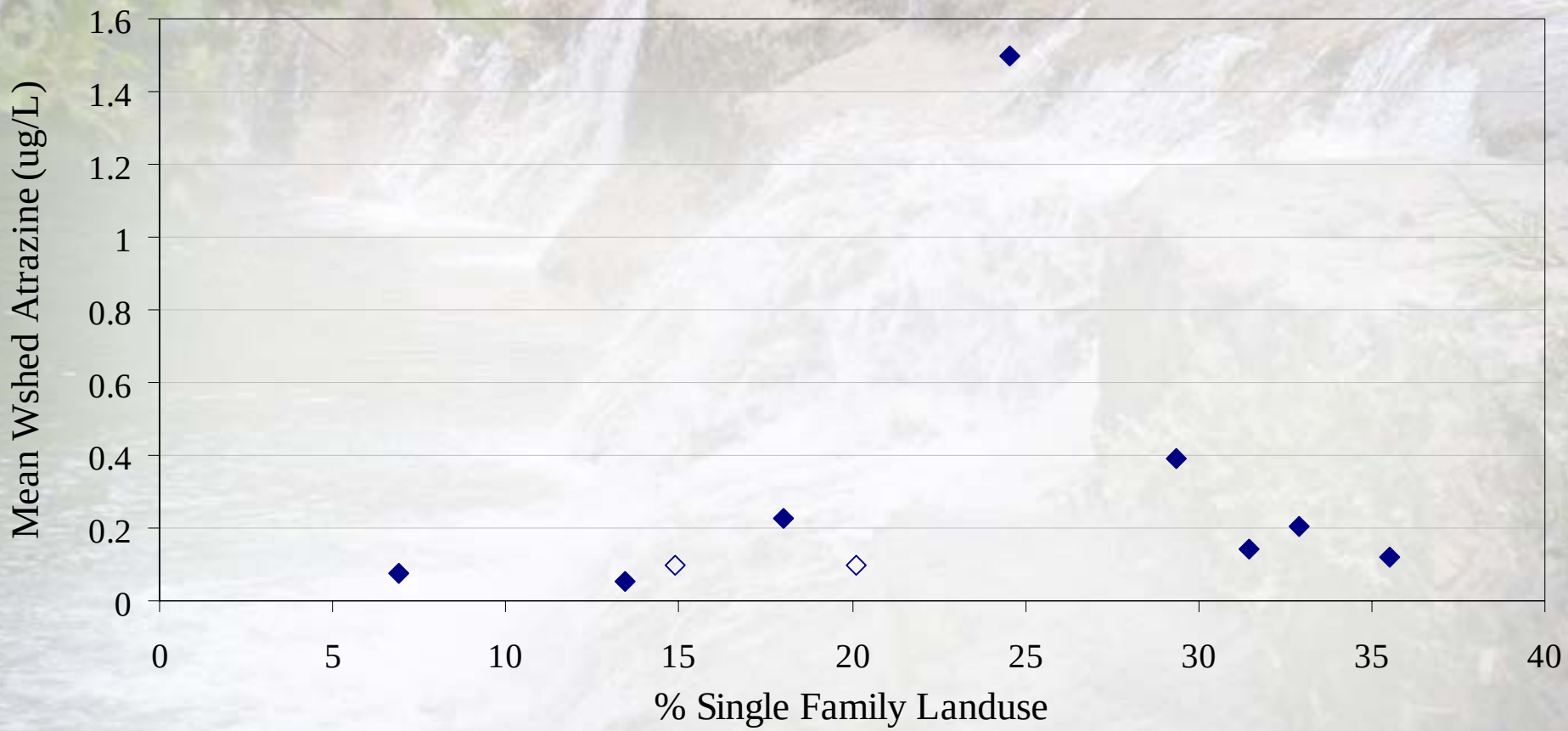
Statewide Problem



Statewide Problem

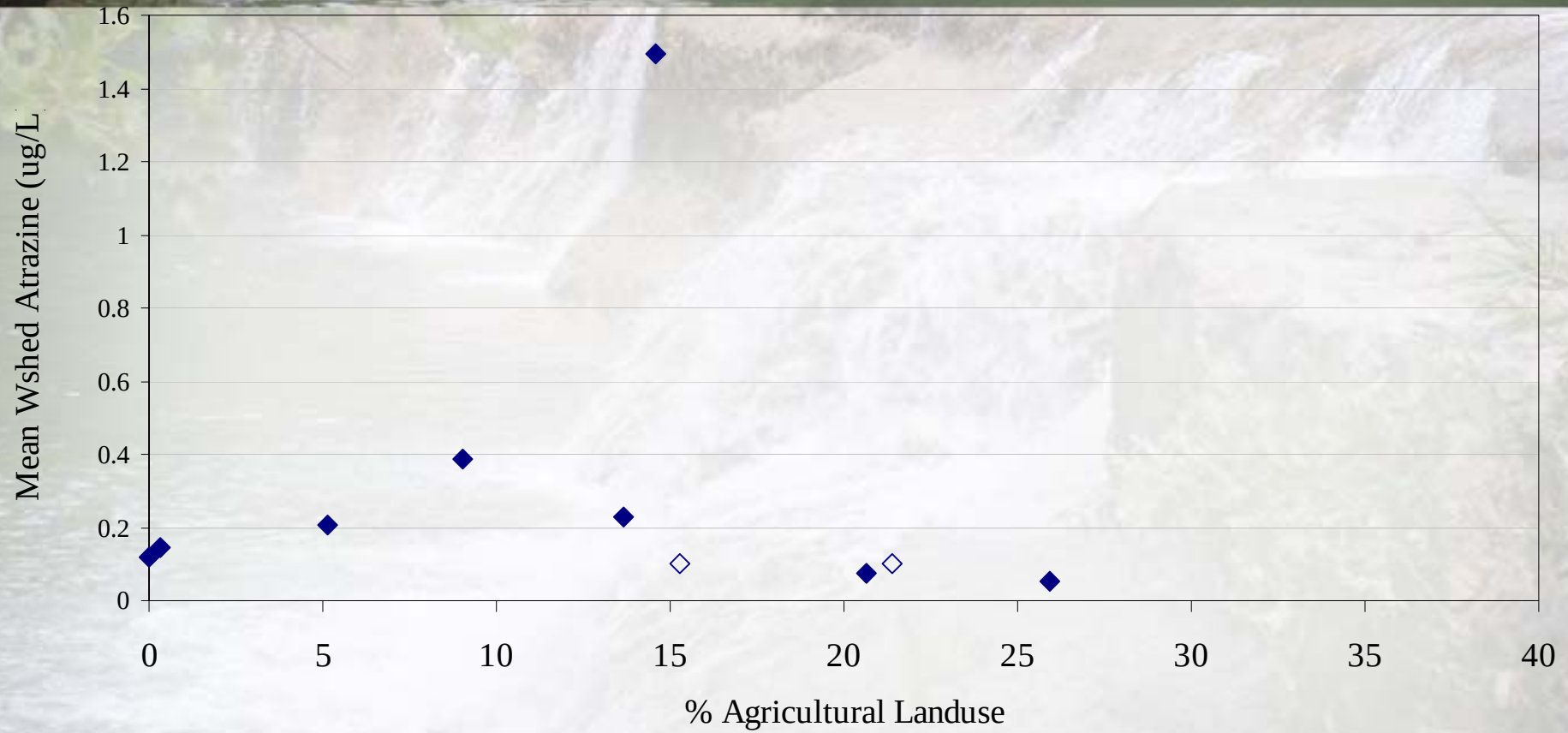
County	2005 population estimate	# samples	# sites	% of *samples* with detected values	% of *sites* with detected values
Harris	3,693,050	38	9	84.2	100.0
Dallas	2,305,454	175	13	94.9	92.3
Tarrant	1,620,479	14	5	57.1	60.0
Bexar	1,518,370	84	5	97.6	60.0
Travis	888,185	121	13	85.1	69.2
El Paso	721,598	105	8	0.0	0.0
Hidalgo	678,275	6	5	0.0	0.0
Collin	659,457	7	5	100.0	100.0
Denton	554,642	25	2	96.0	100.0
Cameron	378,311	66	4	95.5	50.0

Agricultural Sources?



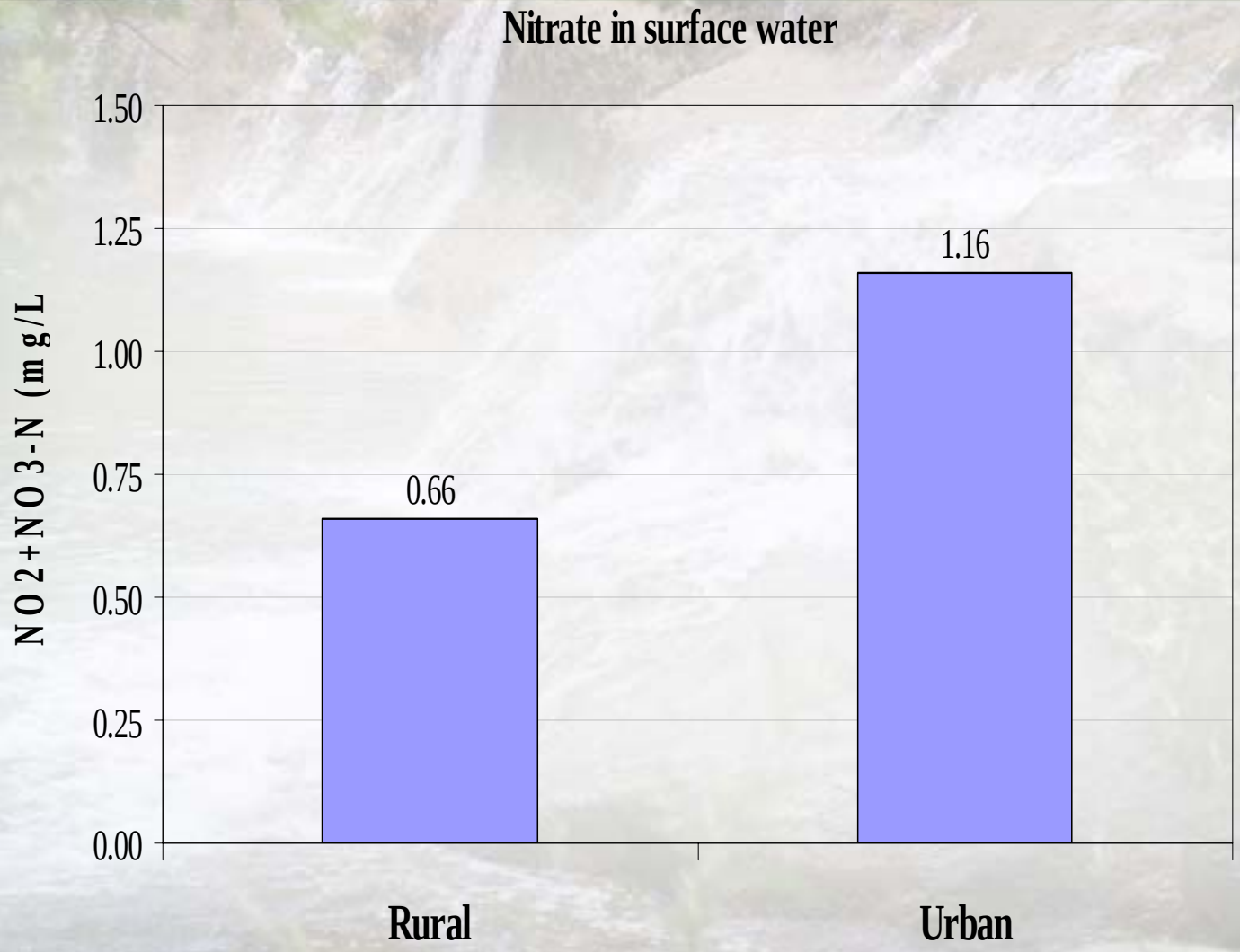
Atrazine correlated to single-family land use in Denton, Texas

Agricultural Sources?

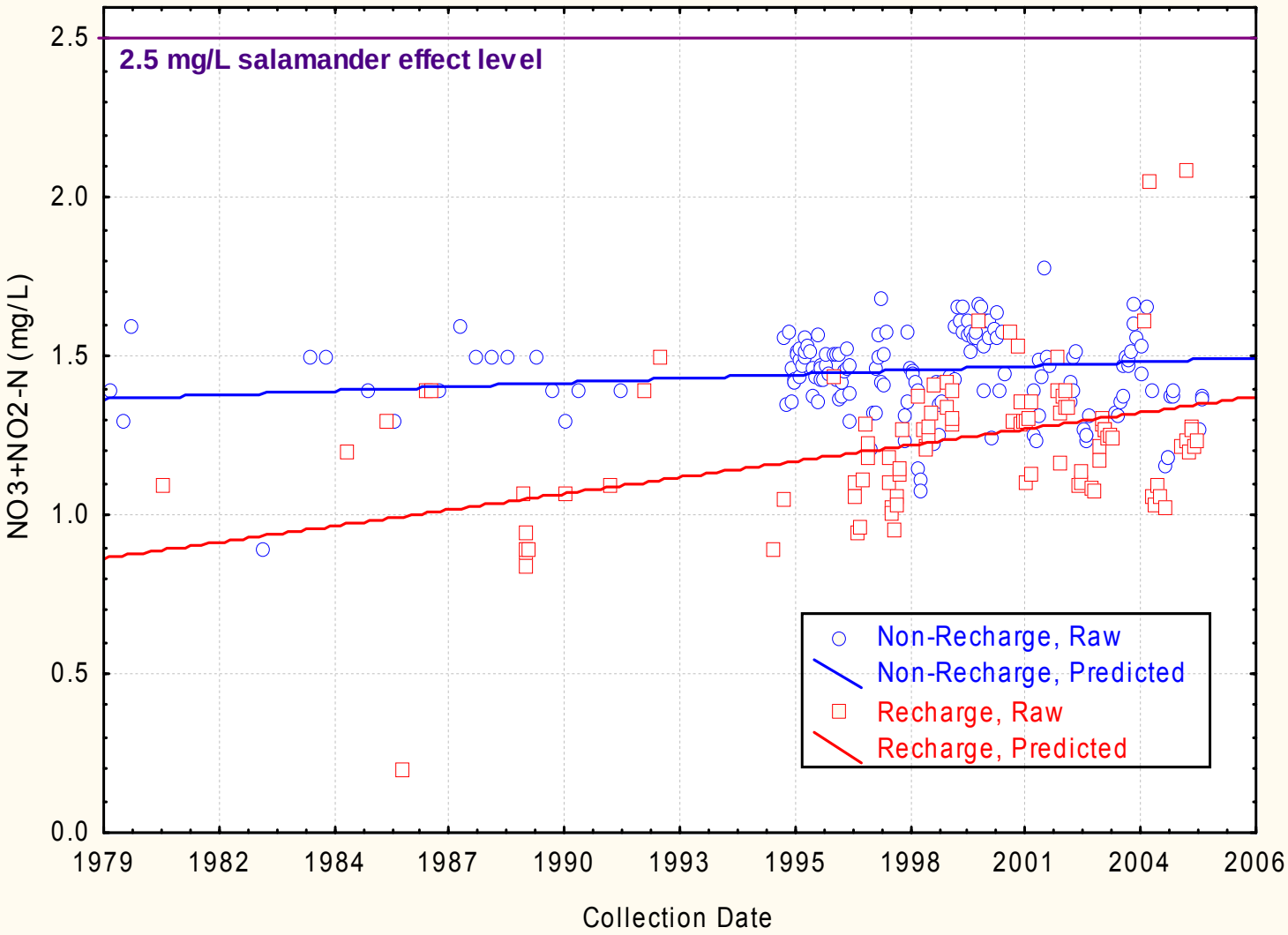


Detected in Austin's urban watersheds

What about the “Feed”?



What about the “Feed”?



Conclusions

- Not an immediate health threat, but definitely a problem
- Homeowner use a probable source in urban areas
- Multiple water quality improvement opportunities
- Change demand, don’t ban atrazine, but ban weed and feed?