

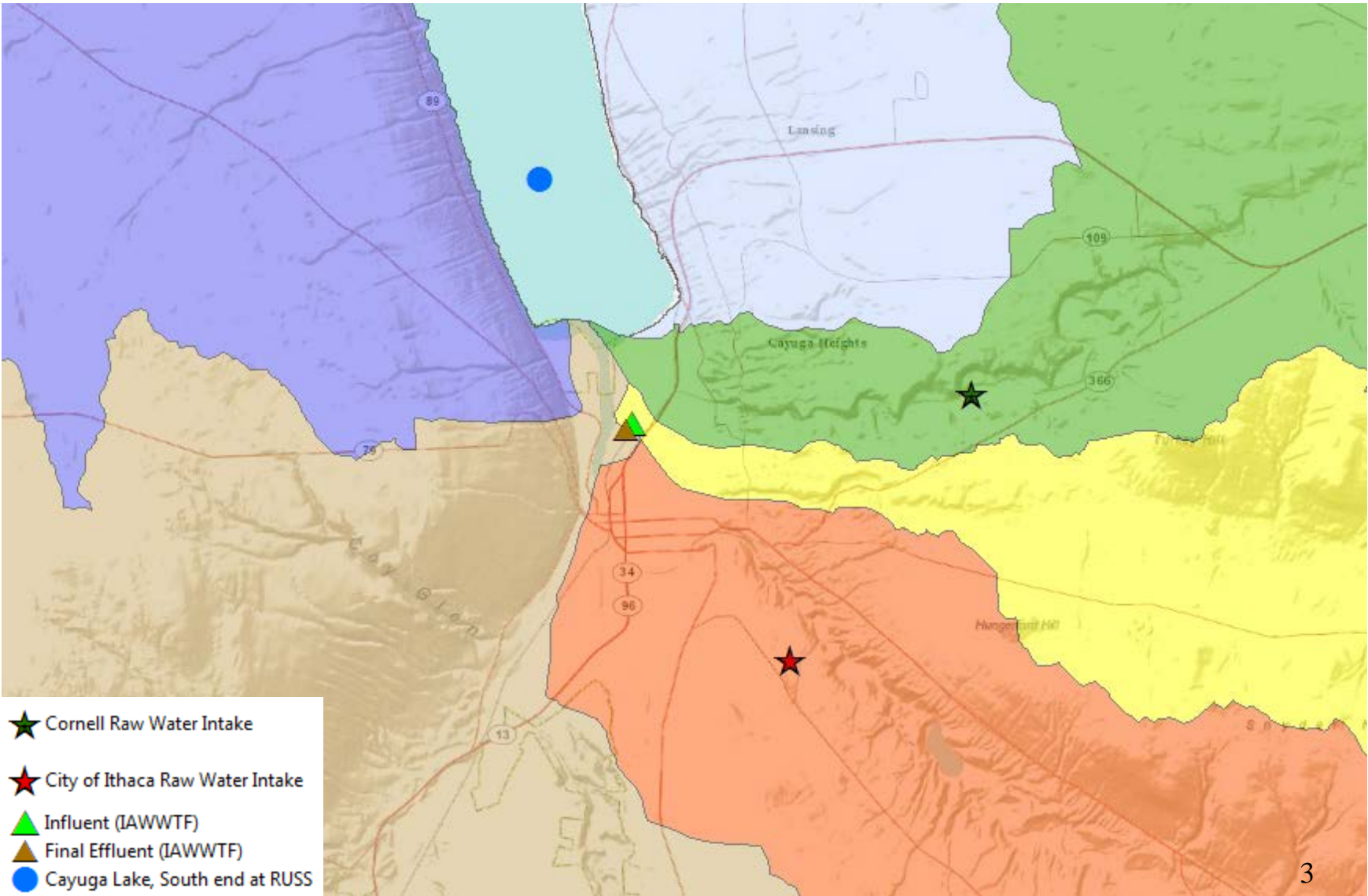


Endocrine Disruptors and Persistent Organics in Ithaca NY.

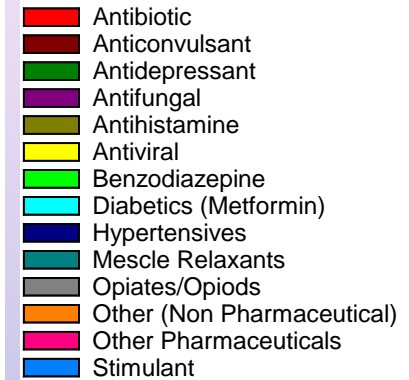
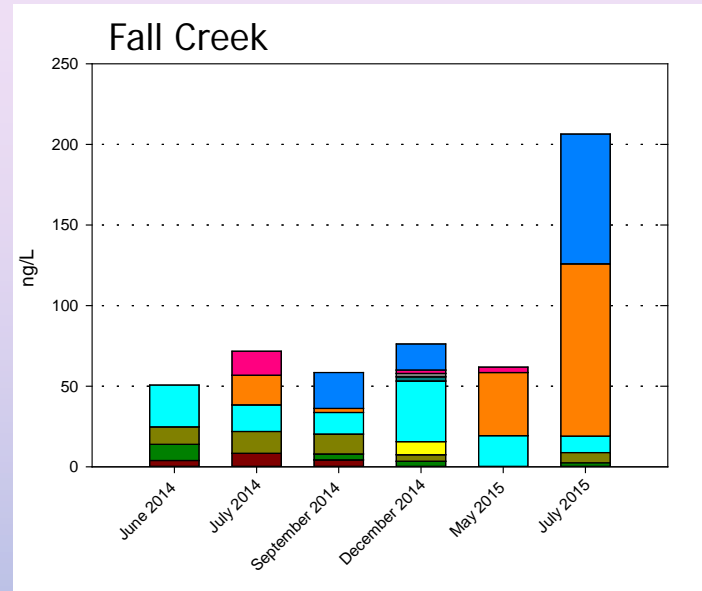
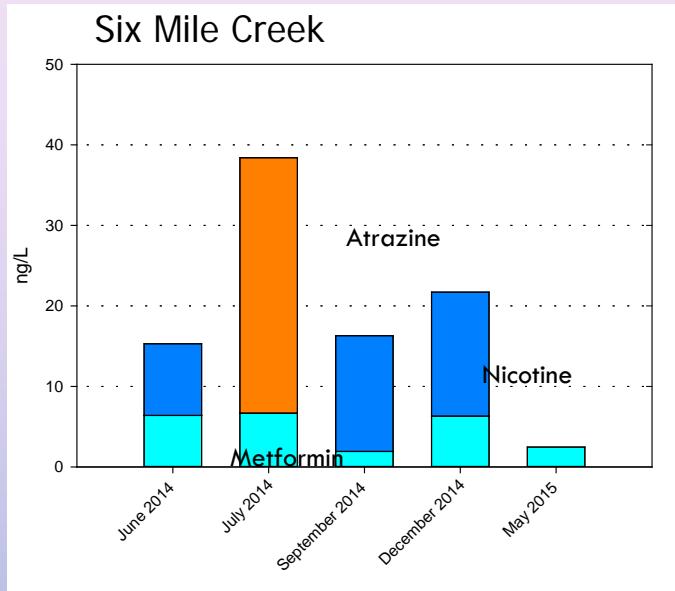
Susan Allen-Gil, Jose L. Lozano
Ithaca College and Ithaca Area Wastewater Treatment Facility.

- PAT PHILLIPS AND TIA-MARIA SCOTT (USGS ALBANY)
- NYS DEPARTMENT OF HEALTH
- ITHACA COLLEGE (SUSAN ALLEN-GIL)
- CORNELL (DAMIAN HELBLING AND AMY POCHODYLO)
- CORNELL COOPERATIVE EXTENSION
- CAYUGA FLOATING CLASSROOM



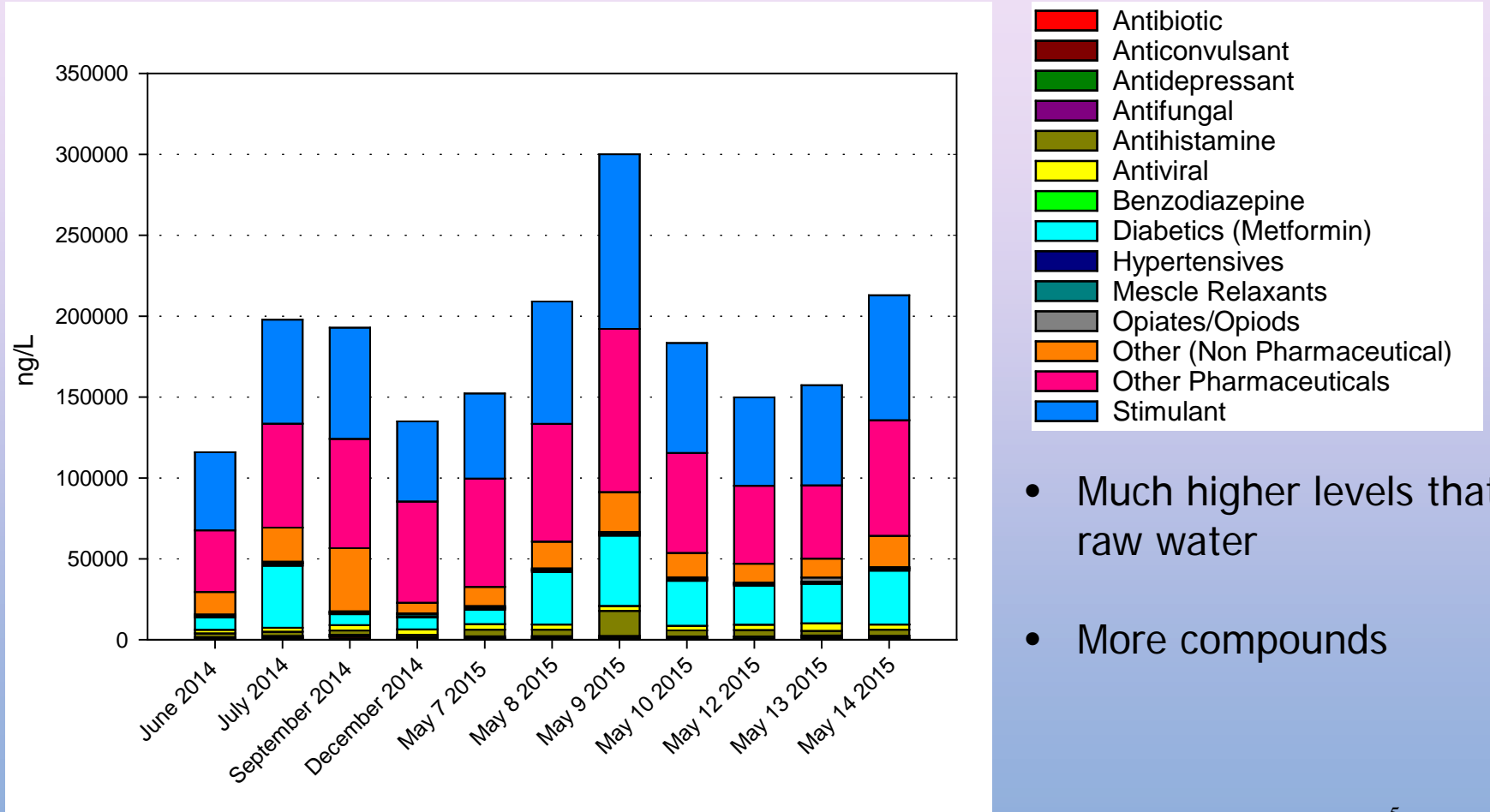


THE STARTING POINT: DRINKING WATER INTAKE



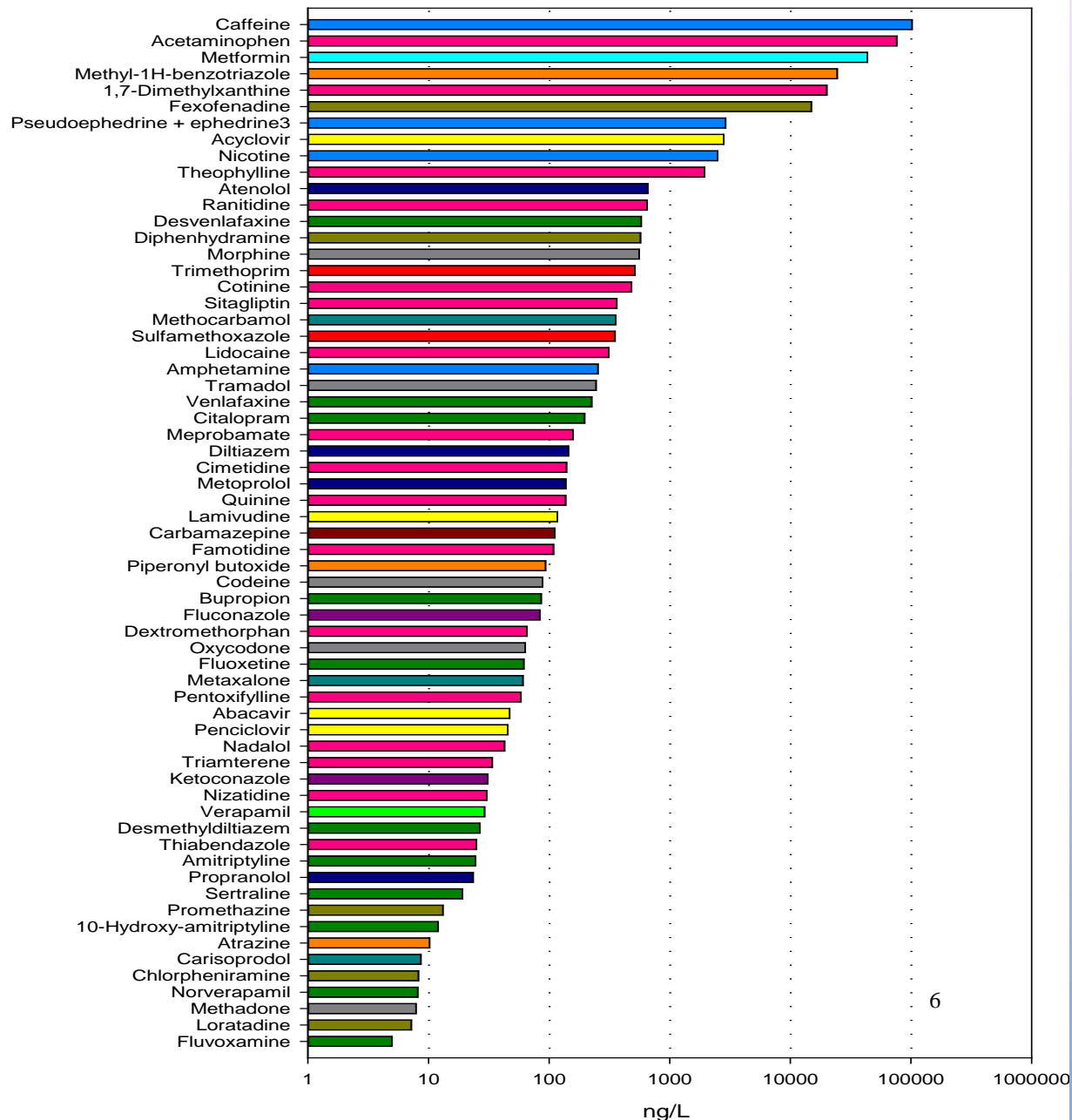
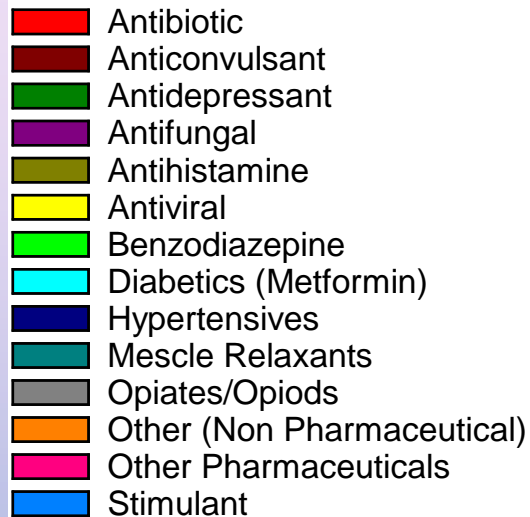
- Six Mile Creek water is cleaner than Fall Creek Water (note scales differ)
- Metformin, atrazine, nicotine, and acetaminophen found most often and at highest concentrations
- Detectable, reportable, but less than 1 pinch of salt on 10 tons of potato chips
- Doesn't mean that is what comes out of your sink! (just atrazine! 35 nanograms/L)

AFTER HUMAN USE: INFLUENT

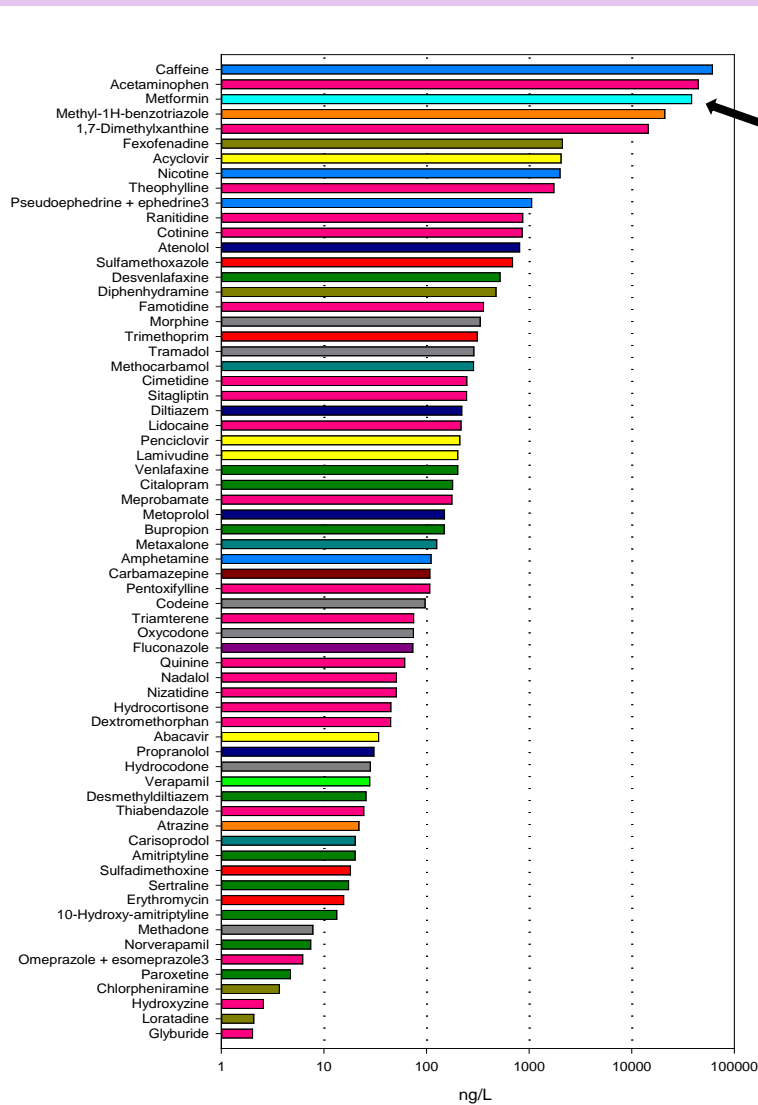


- Much higher levels than raw water
- More compounds

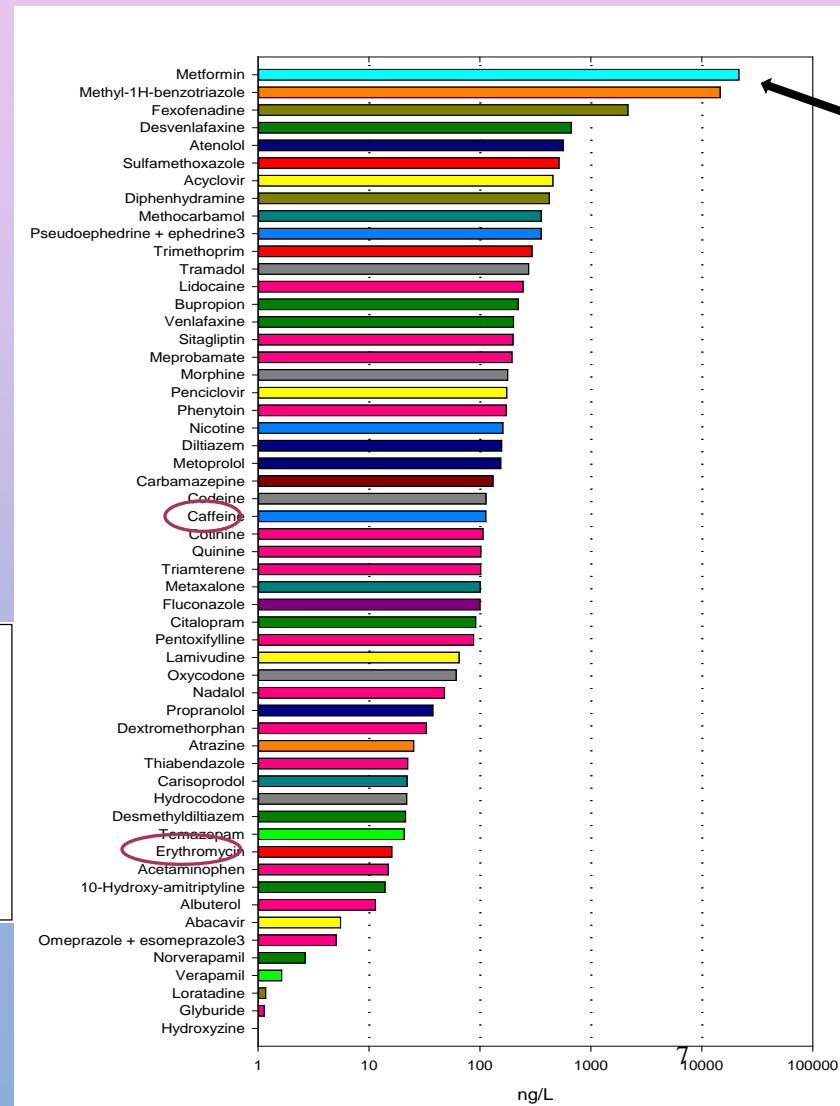
INFLUENT: MAY 9, 2015



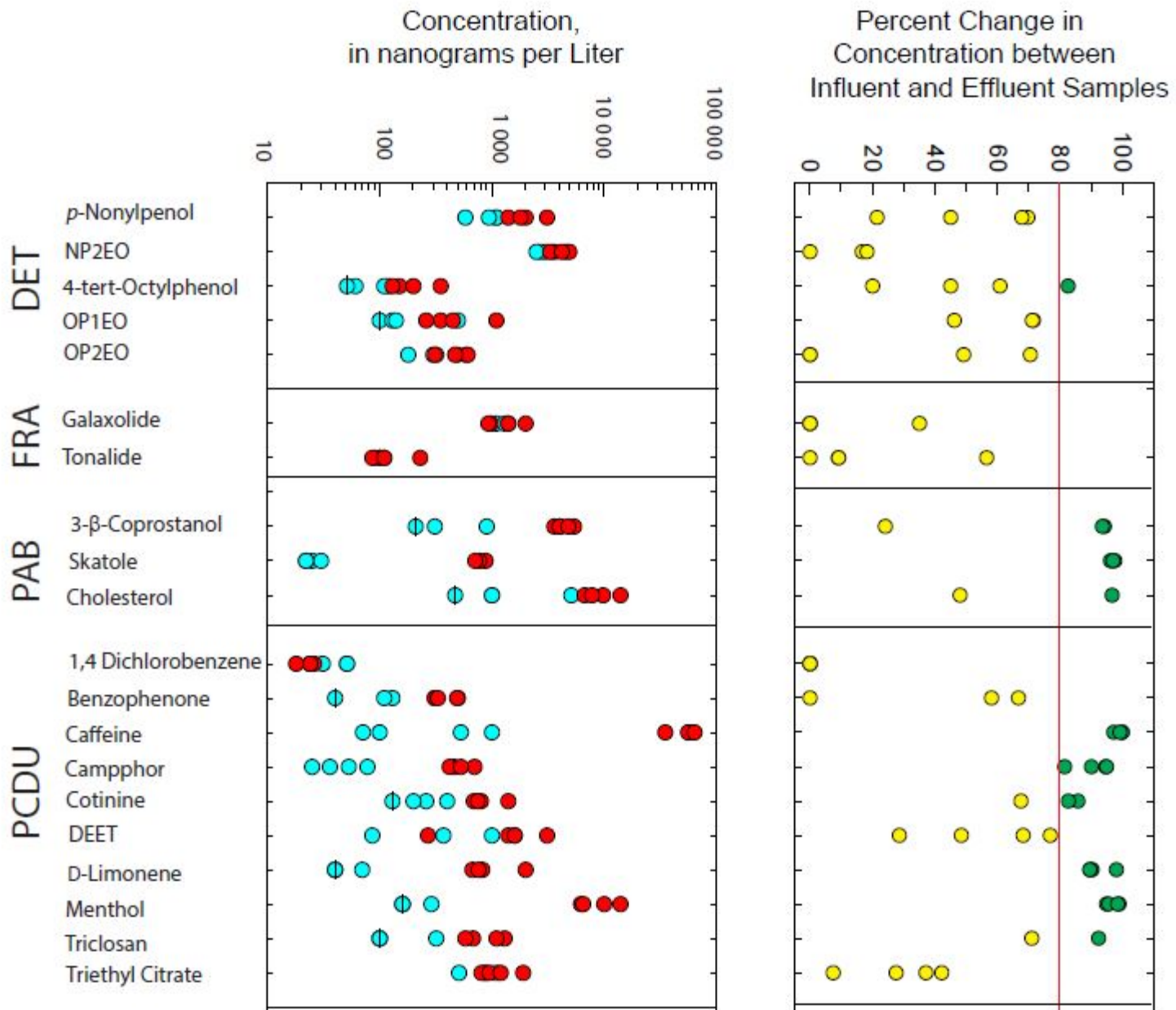
JULY 2014 SH2440 INFLUENT VS. EFFLUENT



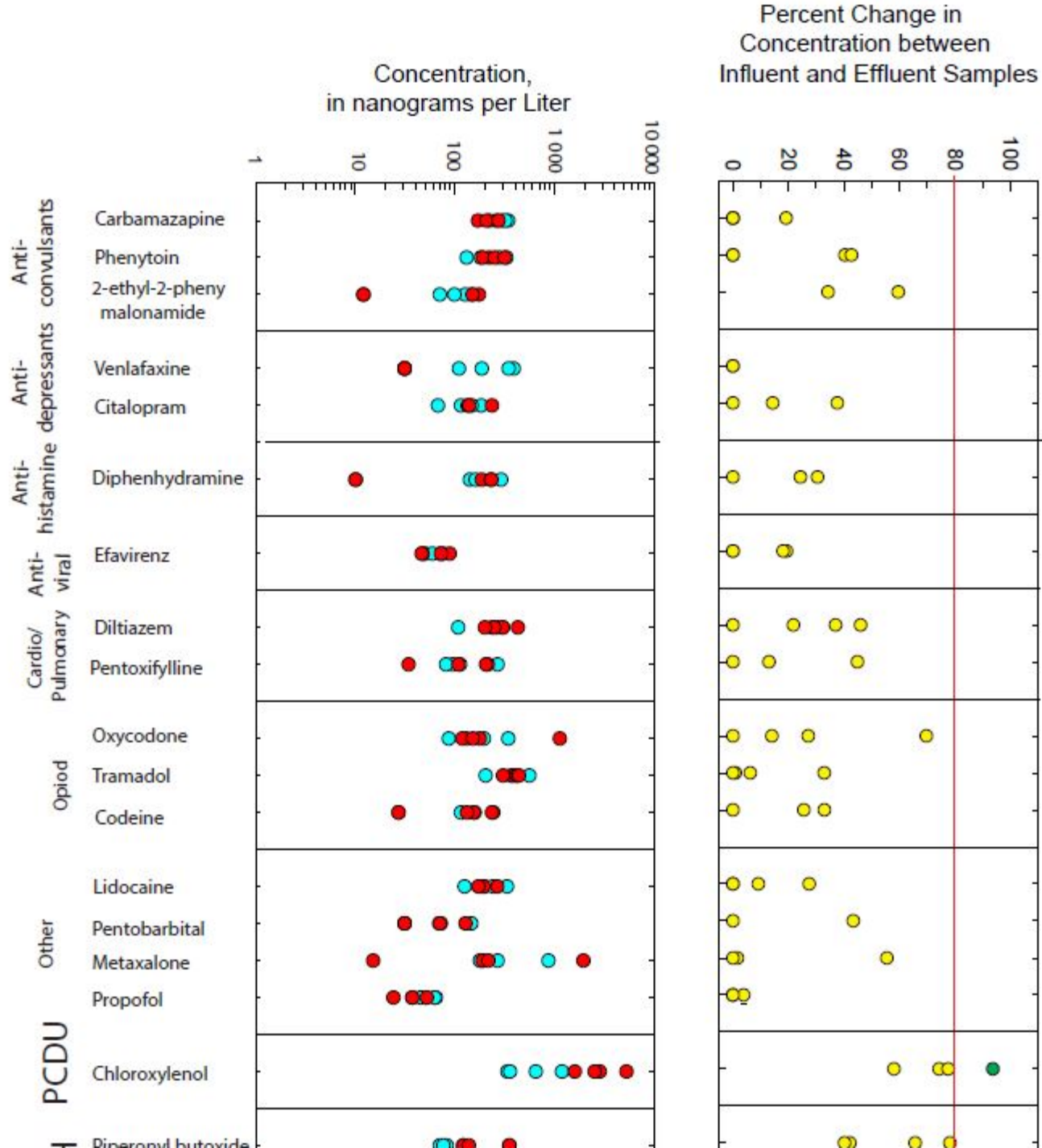
Influent



Effluent



Pharmaceuticals



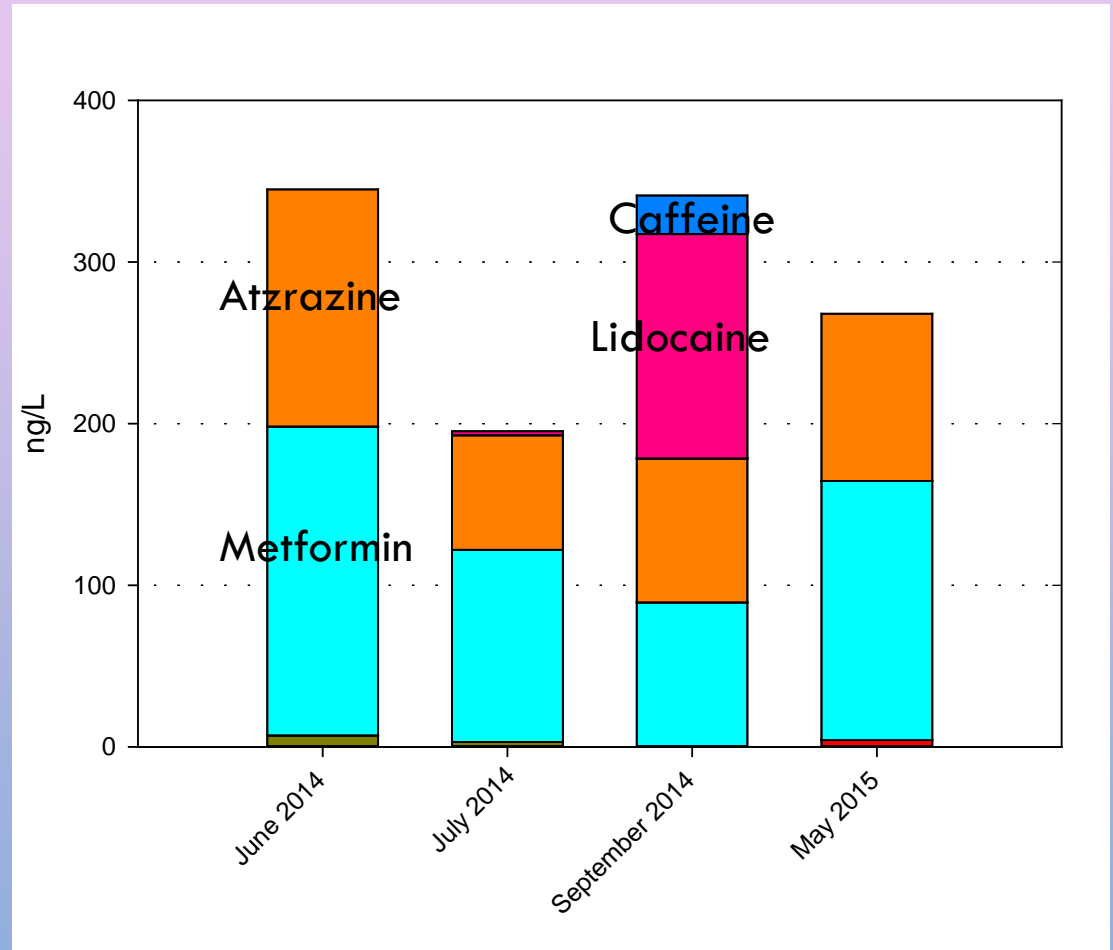
Treatment trend:

Polar escapes

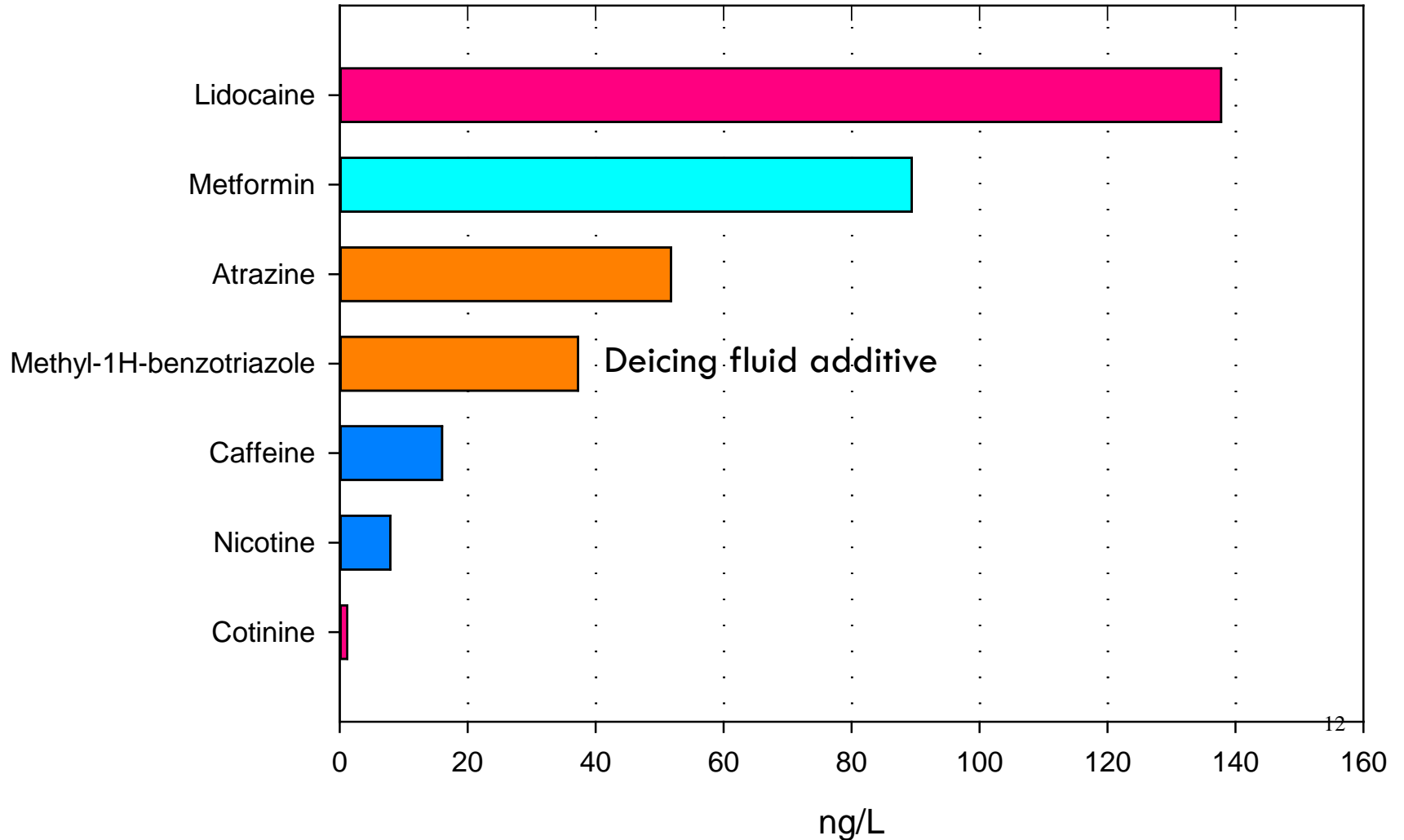
Lipophilic stays

THE ENDING POINT: CAYUGA LAKE

- Much lower concentrations than influent/effluent (100,000 to 300 ng/l)
- But some pharmaceuticals detectable



CAYUGA LAKE PHARMACEUTICALS SEPTEMBER 2014



Compounds Always Detected

- Bis(2-ethylhexyl)phthalate
 - Common plasticizer, classified as a High Production Volume Chemical
- Caffeine
- DEET
- Prometon
 - Herbicide used for landscaping; not used for food crops
- Sucralose
- Venlafaxine
 - Antidepressant

	Compound	Removal efficiency	Compound	Removal efficiency
DET				
	p-Nonylphenol	45%	anti-depressants	
	4-ter-Octylphenol	60%	Bupropion	0%
			Citalopram	0%
PHARM			Desvenlafaxine	0%
	Albuterol	0%		
	Carbamazapin	0%	anti-histaminics	
	Carisoprodol	0%	Chlorpeniramine	0%
	Dextrpmethormophan	0%	Diphenyldramine	0%
	Lidocaine	0%	Fexofenidine	0%
	Meprobamate	0%		
	Metaxalone	0%	cardio/pulmonary	
	Metmorphin	0%	Atenonol	0%
	Methocarbamol	0%	Diltiazem	0%
	Trimethoprim	0%	Pentoxifylyline	0%
	Venlafaxine	0%	Traimterene	0%
	Efavirenz	10%		
	Penciclovor	0%	opioids	
Other			Codeine	0%
	Methyl-1H-benzotriazole	0%	Methadone	0%
	Piperonyl butoxide	20%	Oxycodone	0%
	Propofol	5%	Tramadol	0%

Alternatives:

Avoidance

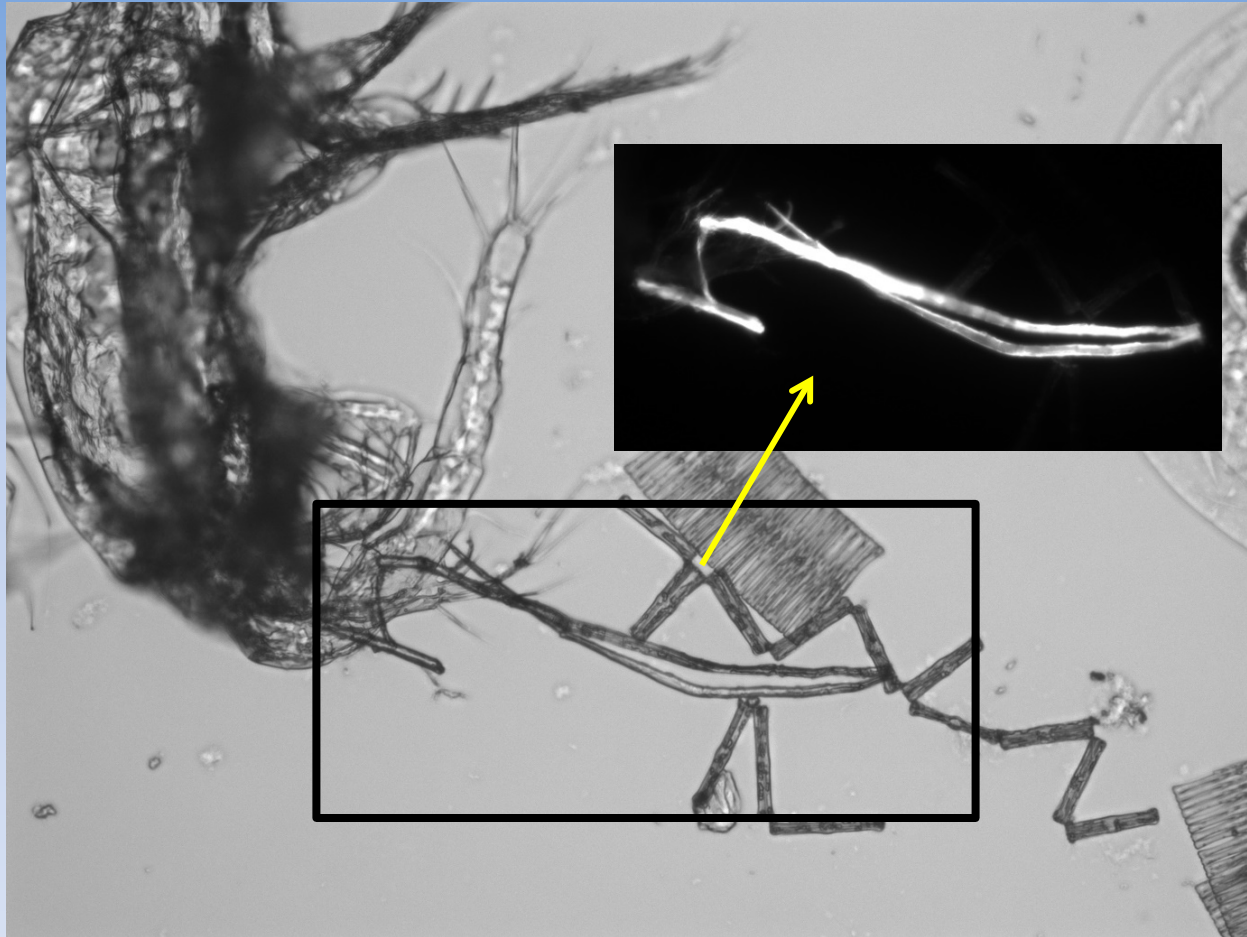
UV-O3 / Filtration

Selective adsorption/desorption (cyclodextrins)

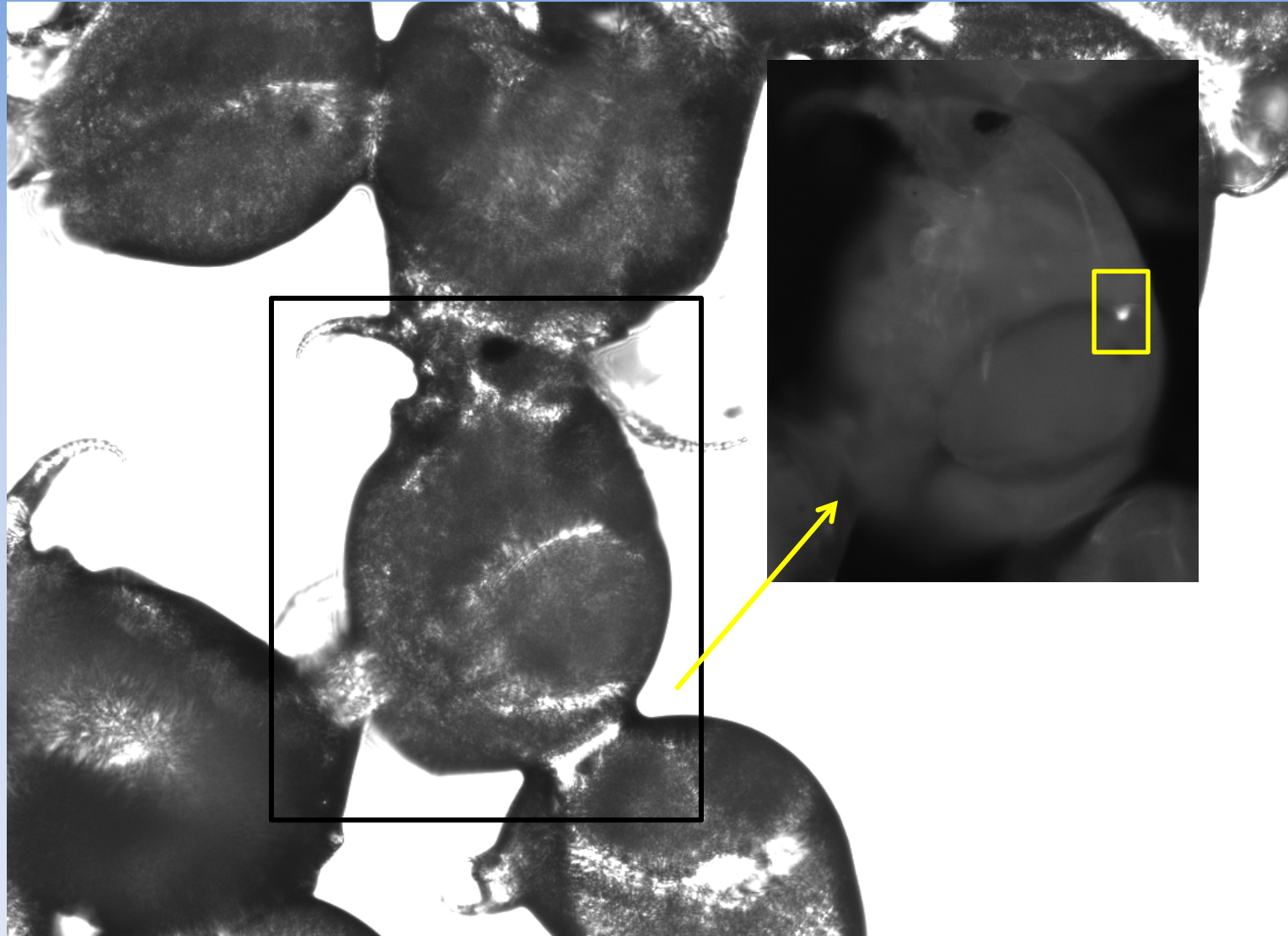
EAG Technology

Also of Concern: Microplastics

Crowbar Sample



Near East Shore Sailing Dock, 2016, appears to be in GI tract





All USGS data will be on the NWIS data base

<http://waterdata.usgs.gov/nwis>

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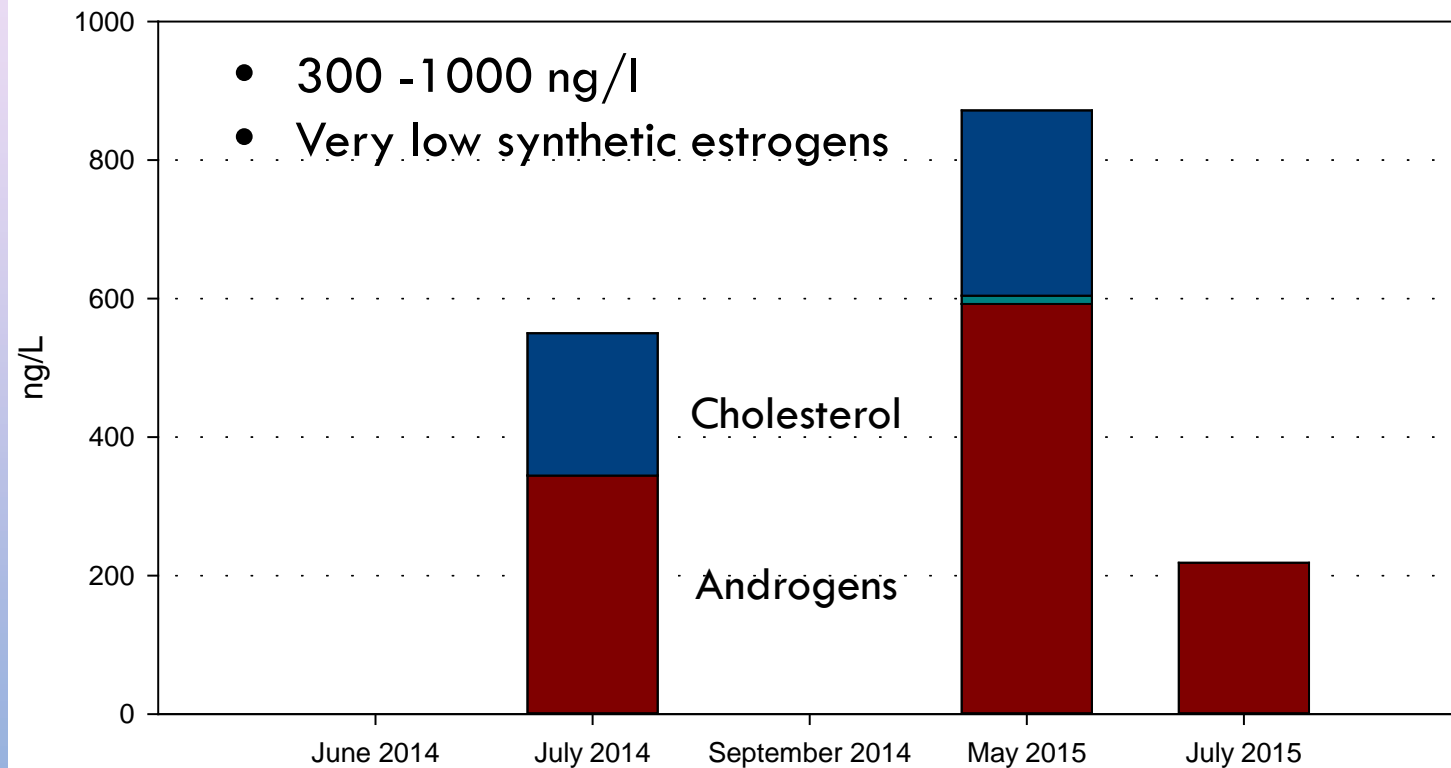
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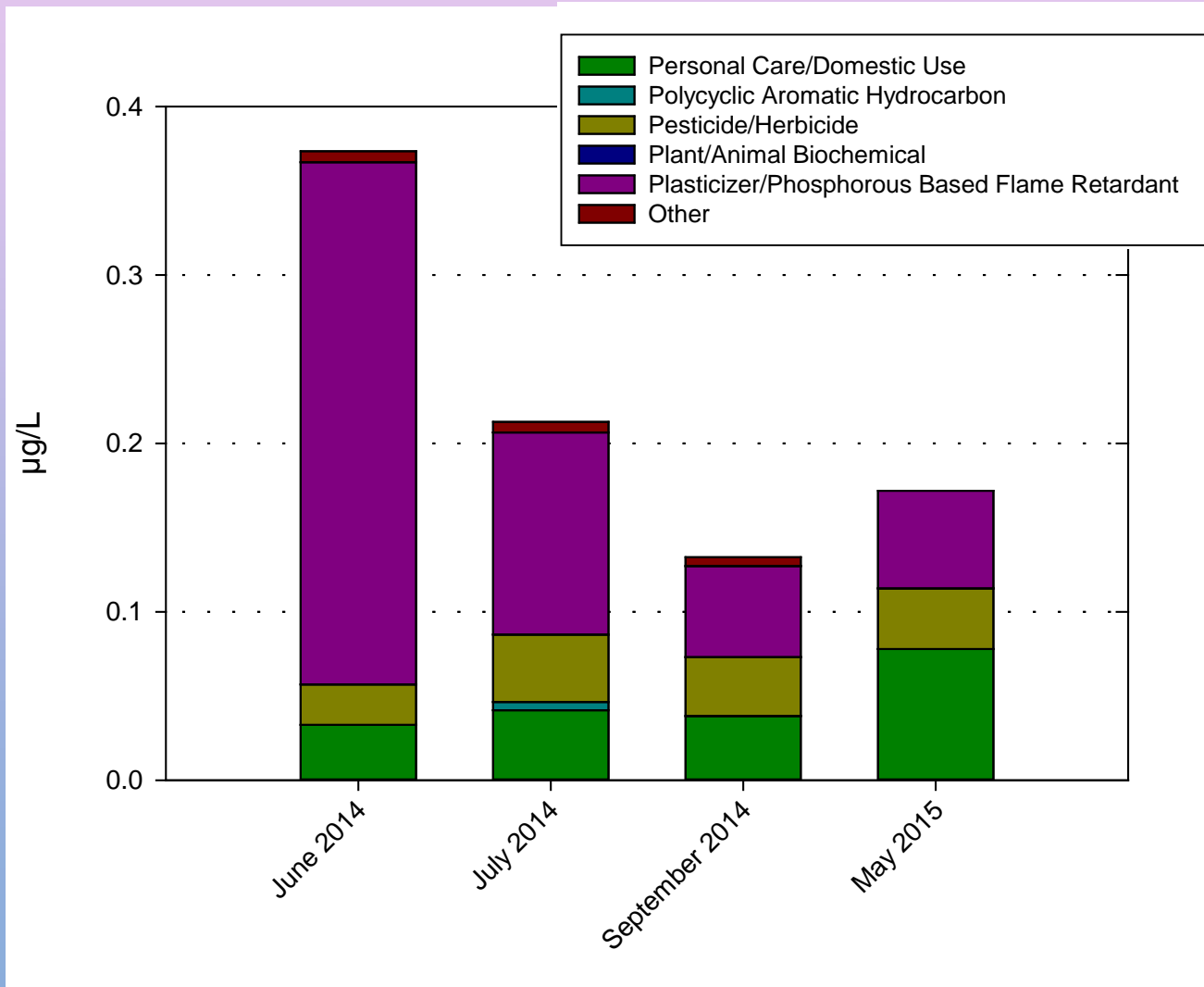
Jose Luis Lozano <jll13@cornell.edu>

<https://drive.google.com/file/d/0BwqAUDio7q27b2JpQjJVTDk0R2c/view?usp=sharing>

THE ENDING POINT: CAYUGA LAKE HORMONES



CAYUGA LAKE: WASTEWATER COMPOUNDS



CAYUGA LAKE: WASTEWATER COMPOUNDS

