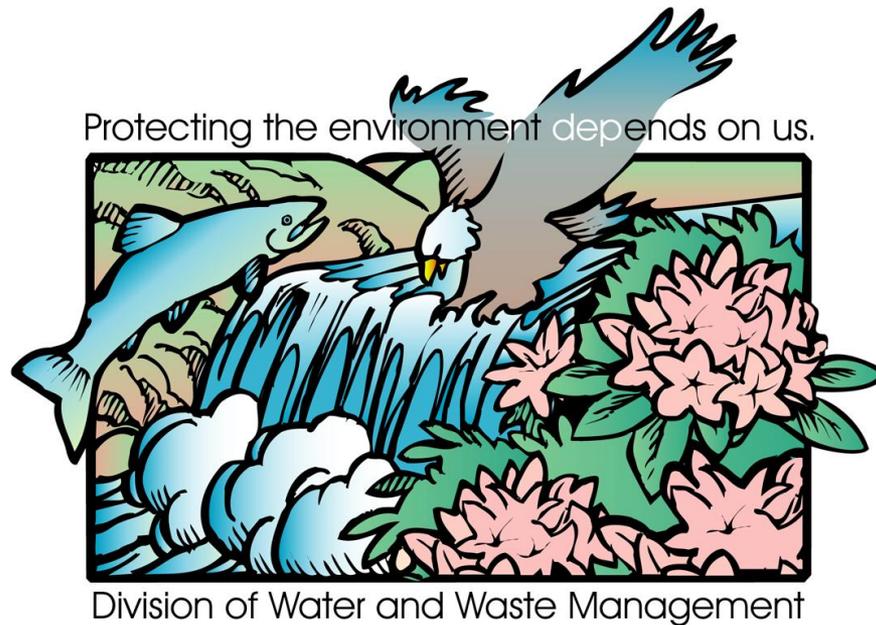


# ***Dunkard Creek Aquatic Life Kills***

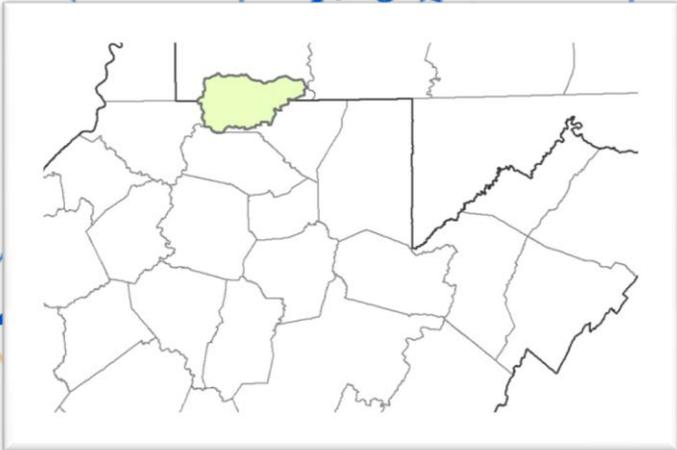
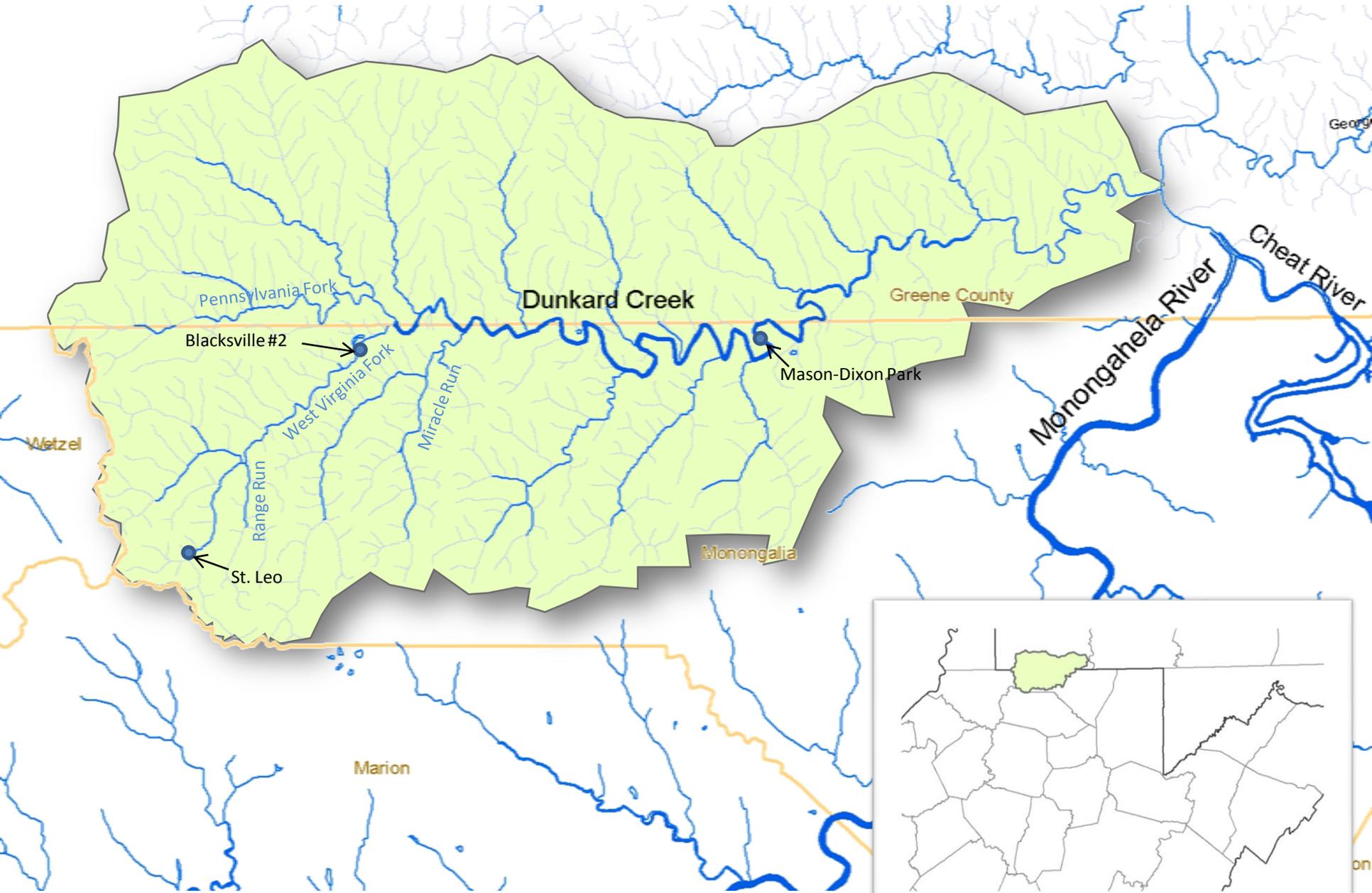
## ***September, 2009***



**Patrick Campbell, DEP-DWWM**

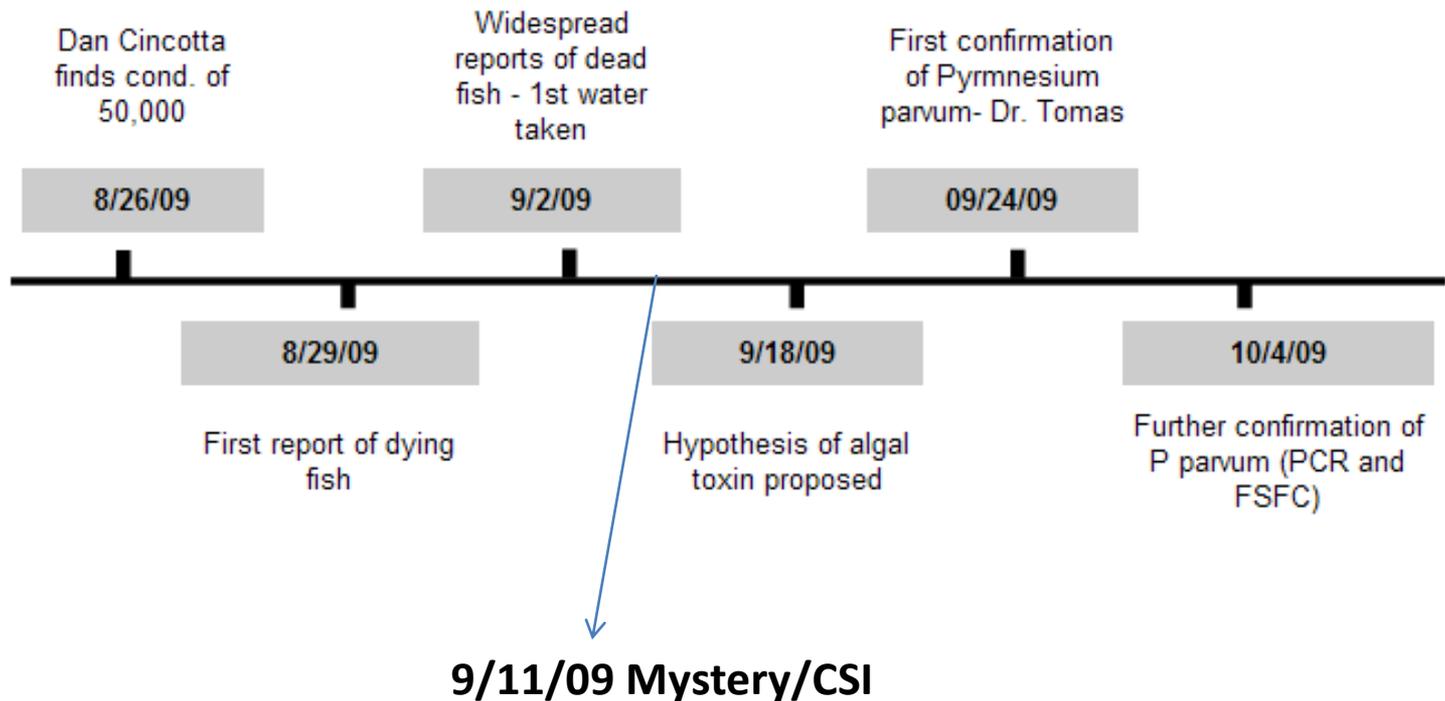
**May 25, 2010**



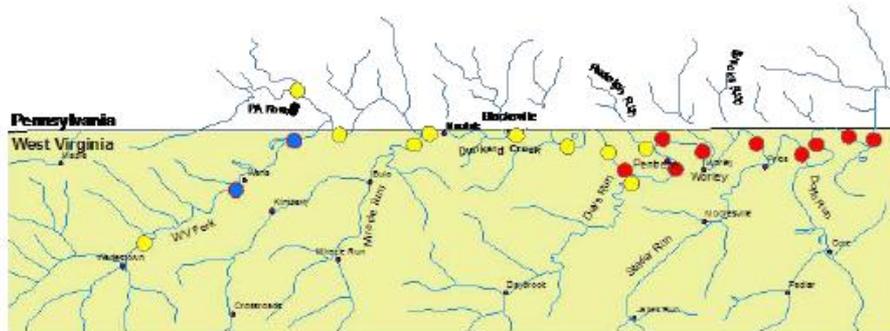




## Timeline of Dunkard Creek Aquatic Life Kill Investigation



**WVDNR - Dunkard Creek Fish Kill Assessment  
September 3, 2009**



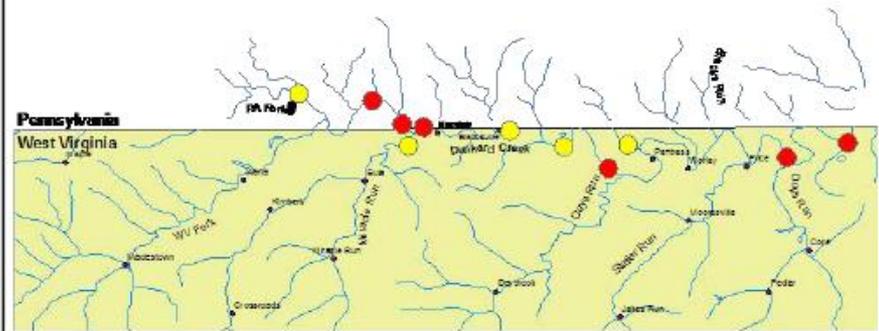
Frank Jarosic  
District 1 Fisheries Biologist  
(304) 525-8787  
frankjarosic@wvdnr.gov



0 0.5 1 2 Miles

- No fish (live or dead)
- Dead fish
- Live fish

**WVDNR - Dunkard Creek Fish Kill Assessment  
September 11, 2009**



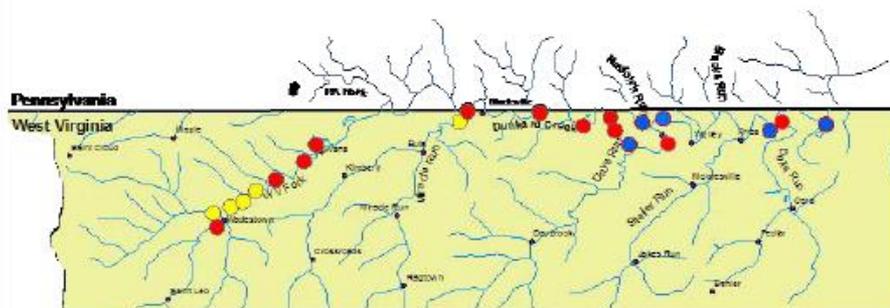
Frank Jarosic  
District 1 Fisheries Biologist  
(304) 525-8787  
frankjarosic@wvdnr.gov



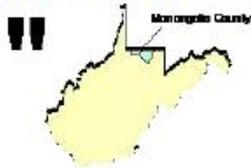
0 0.5 1 2 Miles

- Dead fish
- Live fish

**WVDNR - Dunkard Creek Fish Kill Assessment  
September 17, 2009**



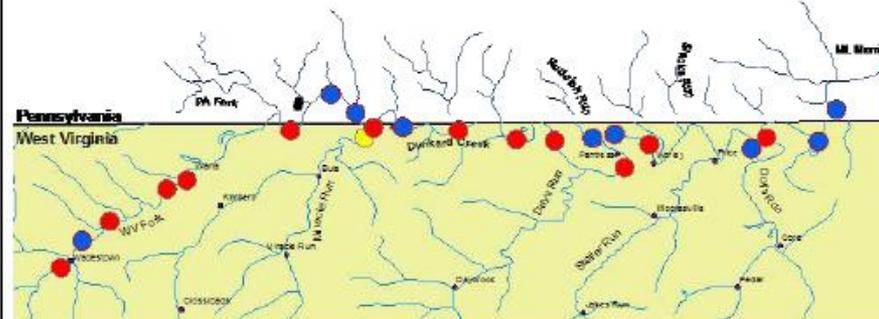
Frank Jarosic  
District 1 Fisheries Biologist  
(304) 525-8787  
frankjarosic@wvdnr.gov



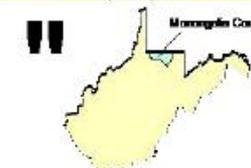
0 0.5 1 2 Miles

- No fish (live or dead)
- Dead fish
- Live fish

**WVDNR - Dunkard Creek Fish Kill Assessment  
September 21, 2009**



Frank Jarosic  
District 1 Fisheries Biologist  
(304) 525-8787  
frankjarosic@wvdnr.gov



0 0.5 1 2 Miles

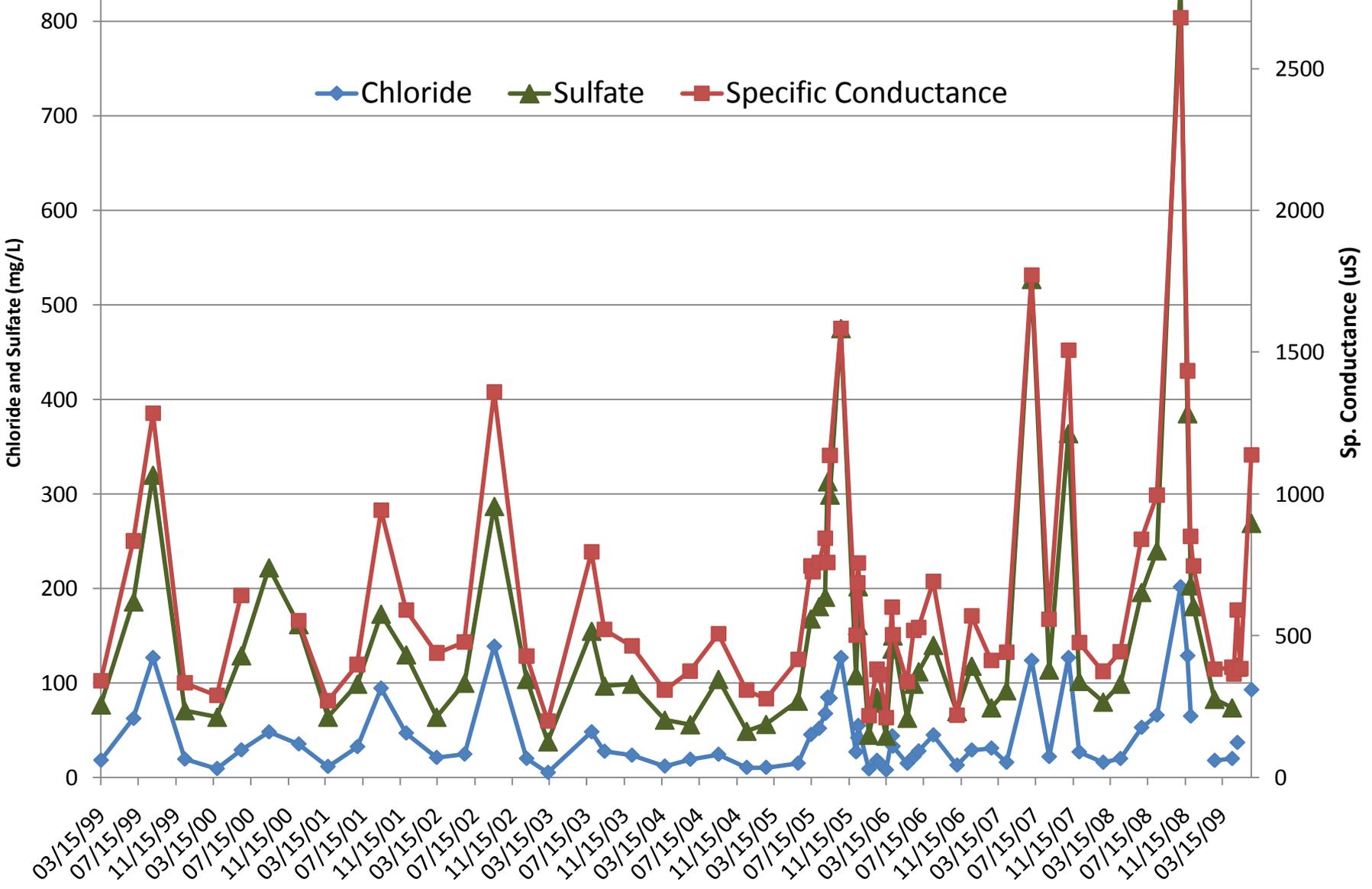
- No fish (live or dead)
- Dead fish
- Live fish



Photo – WVDEP Jeff Bailey DOH Garage 9/18/0



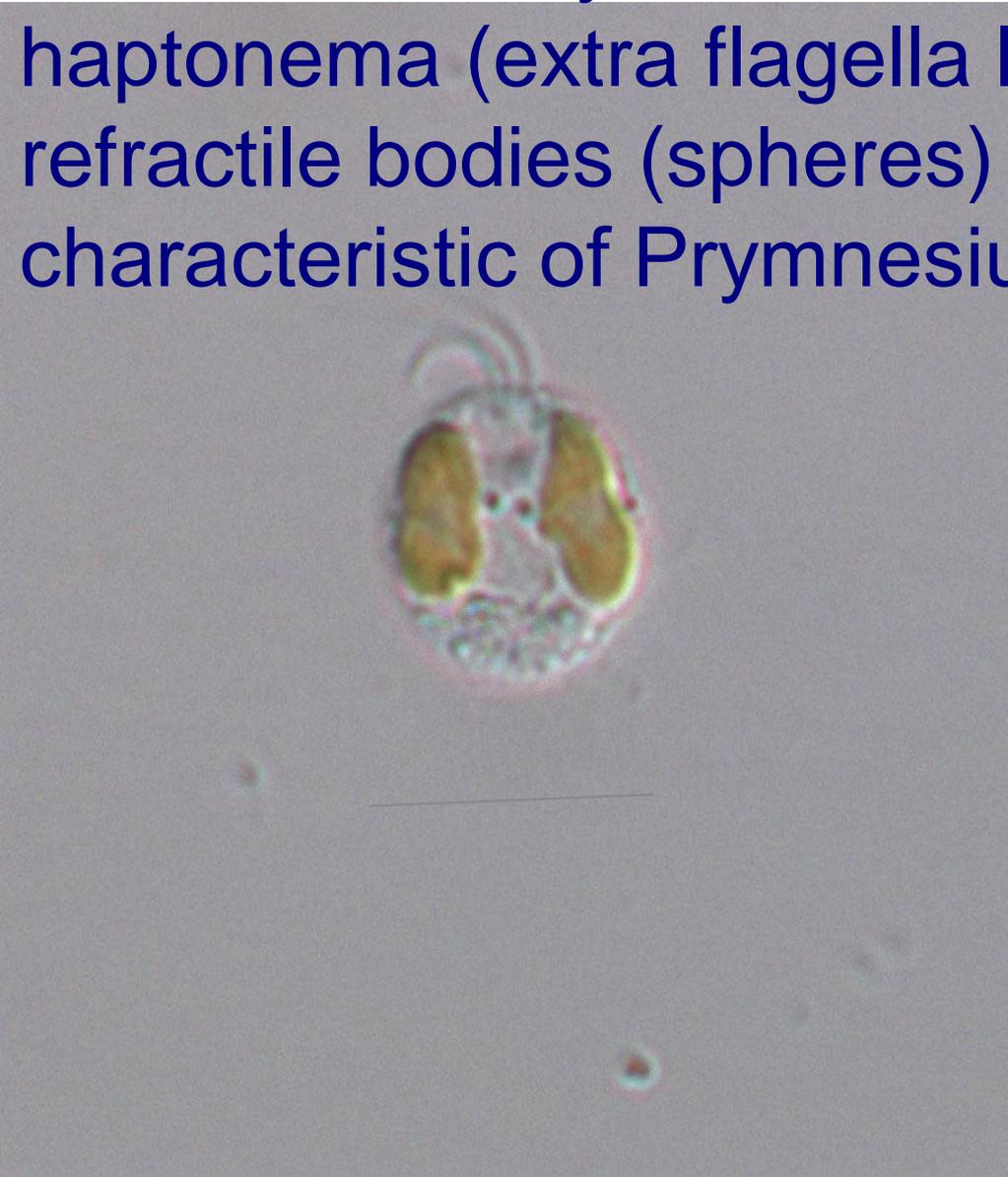
# Dunkard Creek Ambient Site Data 1999 to present



## WVDEP Pre-TMDL Development Monitoring – July 2005 thru June 2006 v. Recent Data WV & PA DEP data

Location	pH			Conductivity			Sulfate			Chloride		
	Avg	Max	recent	Avg	Max	recent	Avg	Max	recent	Avg	Max	recent
South Fork/West Virginia Fork	7.98	8.78	9.03	4,815	12,776	9,400 - 10,370	1,766	5,066	3,510	405	1,082	1,300
West Virginia Fork/Dunkard Creek @ mp 2.7 (Wana)	7.74	8.42	8.38	1,900	6,805	3,700 - 4,590	611	2,483	1,110	143	545	408
West Virginia Fork/Dunkard Creek @ mp 0.1	7.77	8.51	8.56	1,904	6,495	5690*-33,800	600	2,192	1,180 - 8,300	165	660	740*-4500
Pennsylvania Fork/Dunkard Creek near mouth	7.59	8.09	7.6-8.1	243	352	332-672	33	40	32.5 - 42.7	6	12	6 to 16
Miracle Run near mouth	7.65	7.95	7.8 - 8.2	1,729	3,387	3660-4120	645	1,340	1,854	78	163	239
Dunkard Creek @ Mason Dixon Park	7.86	8.35	8.88	640	1,584	1900 - 2558	163	475	754	43	127	226

“You can clearly see the two flagella, haptonema (extra flagella like structure) and refractile bodies (spheres) within cells. All characteristic of *Prymnesium parvum*”



**Dr. Carmello Tomas, UNC-Wilmington**

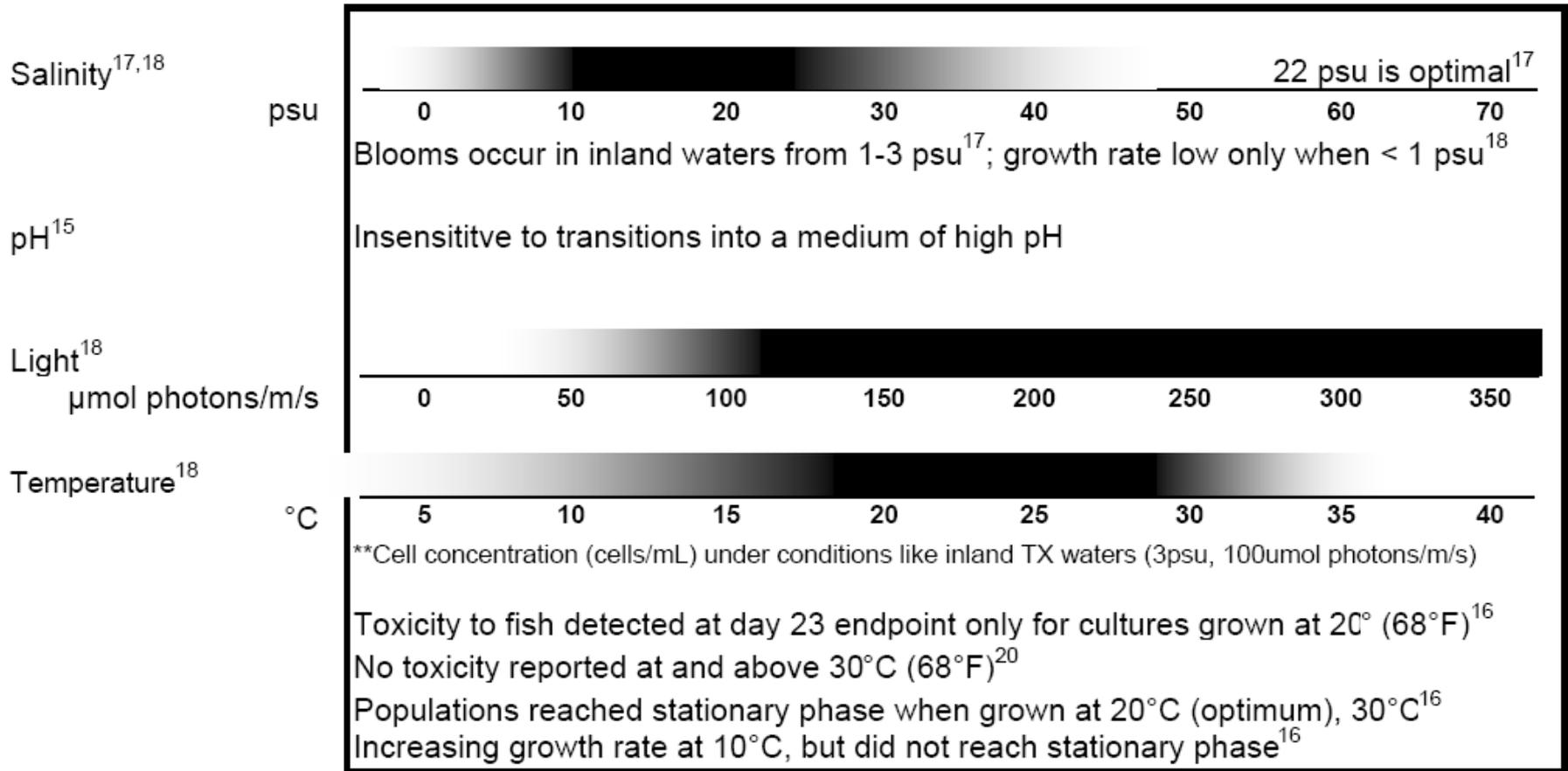


***Prymnesium parvum*** is a [haptophyte](#), belonging to [Haptophyta](#) (=Prymnesiophyta). The species is of concern because of its ability to produce a toxin. It is a flagellated alga that is normally found suspended in the water column. It was first identified in [North America](#) in 1985 and it is not known if it was introduced artificially (e.g., an invasive species or missed in previous surveys). Toxin production mainly kills fish and appears to have little effect on cattle or humans. This distinguishes it from [red tide](#), which are algal bloom whose toxins lead to harmful effects in people. Although no harmful effects are known, it is recommended not to consume dead or dying fish exposed to a *P. parvum*

# Wisconsin Information – *Prymnesium parvum*

## Tolerance

\*\*increasingly dark color indicates increasingly optimal range



# **Prymnesium Parvum Cells/mL**

**WANA 345,320**

**MDP 242,300**

**WTL 304,600**

**UMR 102,200**

**DBP 94.600**

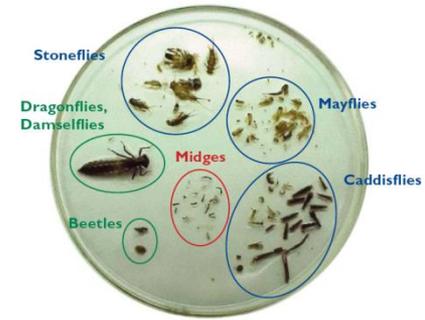
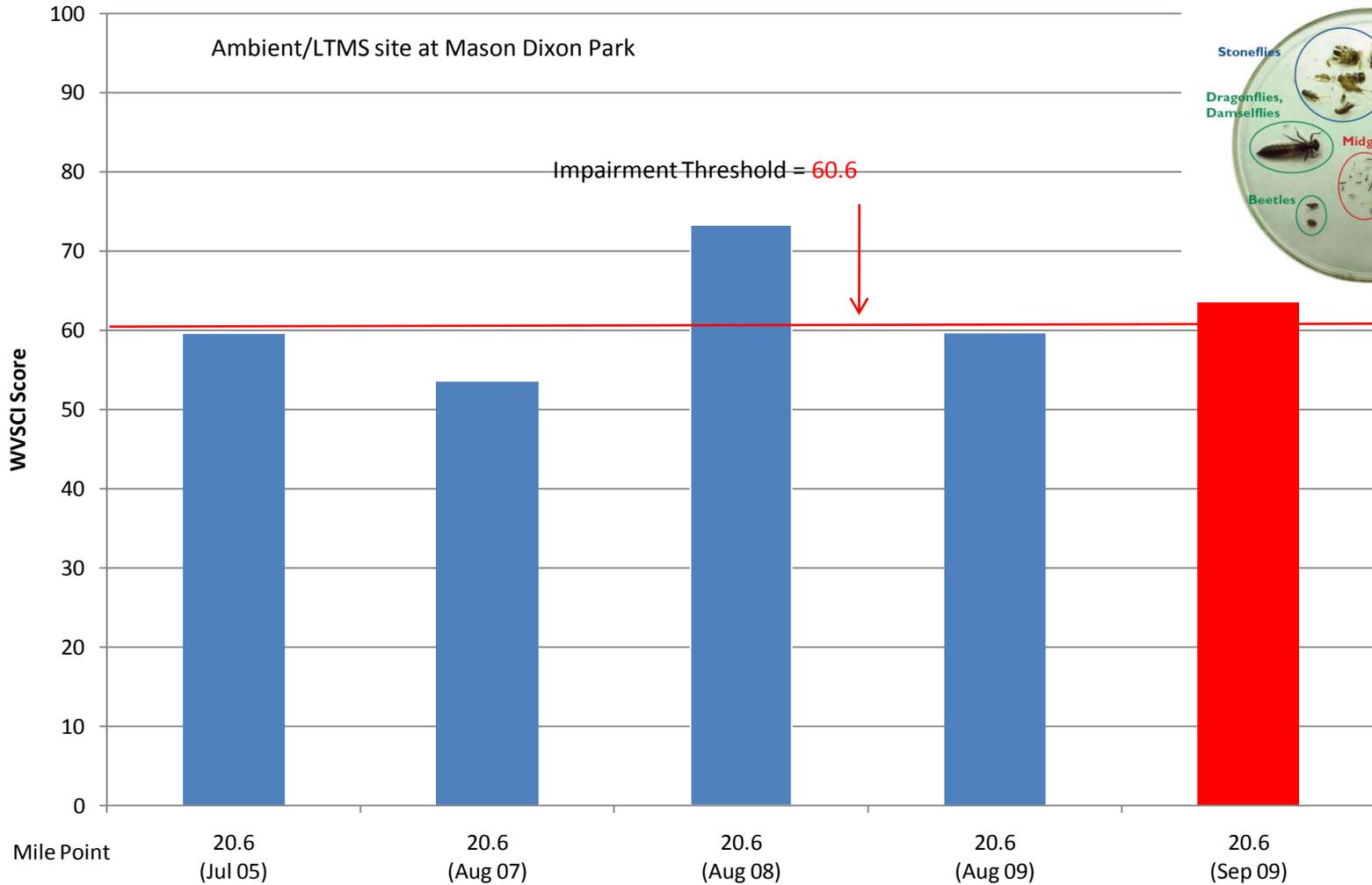
Oklahoma – kills 50k+

**UBD 460**



14/100%

**WVSCI scores for Dunkard Creek mainstem. Red bars represent benthic samples collected during significant aquatic life kill in September 2009.**



# Prymnesium parvum

- May have been around awhile, slow growing
- Toxicity at lower cell counts
- Toxicity when stressed
- High counts no toxicity
- Nutrients, salinity, hydrology, pH are key components
- Much more to learn, humbling



# Key Questions

- Where did it come from?
- Should I be worried?
- Is it in other waters?
- What are you going to do about it?

<b>Abundance/range</b>	
Widespread:	Worldwide temperate zones <sup>13</sup>
Locally Abundant (blooms):	Baltic Sea, inland & coast of US, China, Europe, Australia, Morocco, Israel <sup>9</sup>
Present:	TX, AZ, NM, CO, WY, NC, SC, GA, AR, AL; likely OK, NE <sup>14</sup>

# Thanks for your interest!



[www.dep.wv.gov](http://www.dep.wv.gov) (search on dunkard)

Photo's courtesy of WVDEP's Mike Carico/Brad Swiger



west virginia department of environmental protection