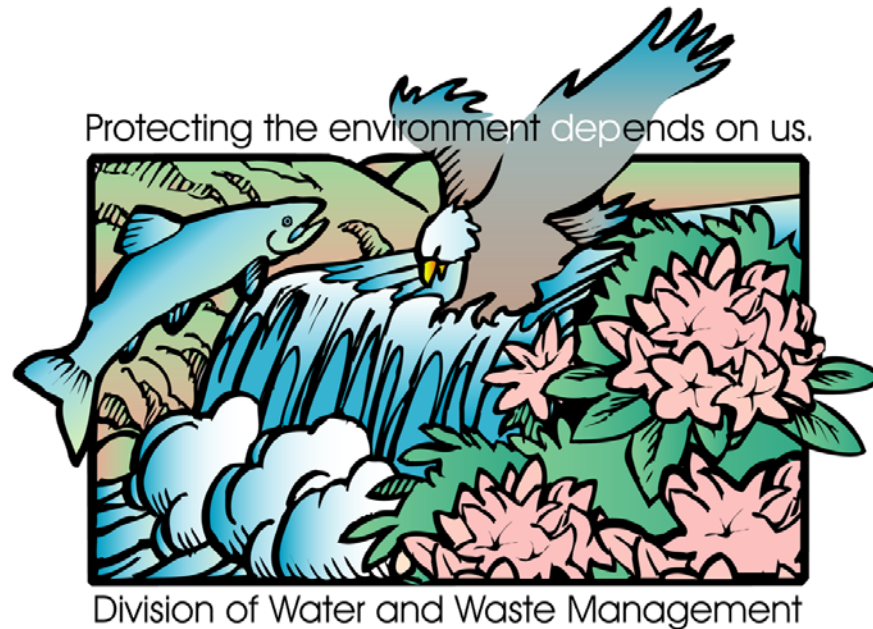


# ***Update – Dunkard Creek and Other WV Waters***

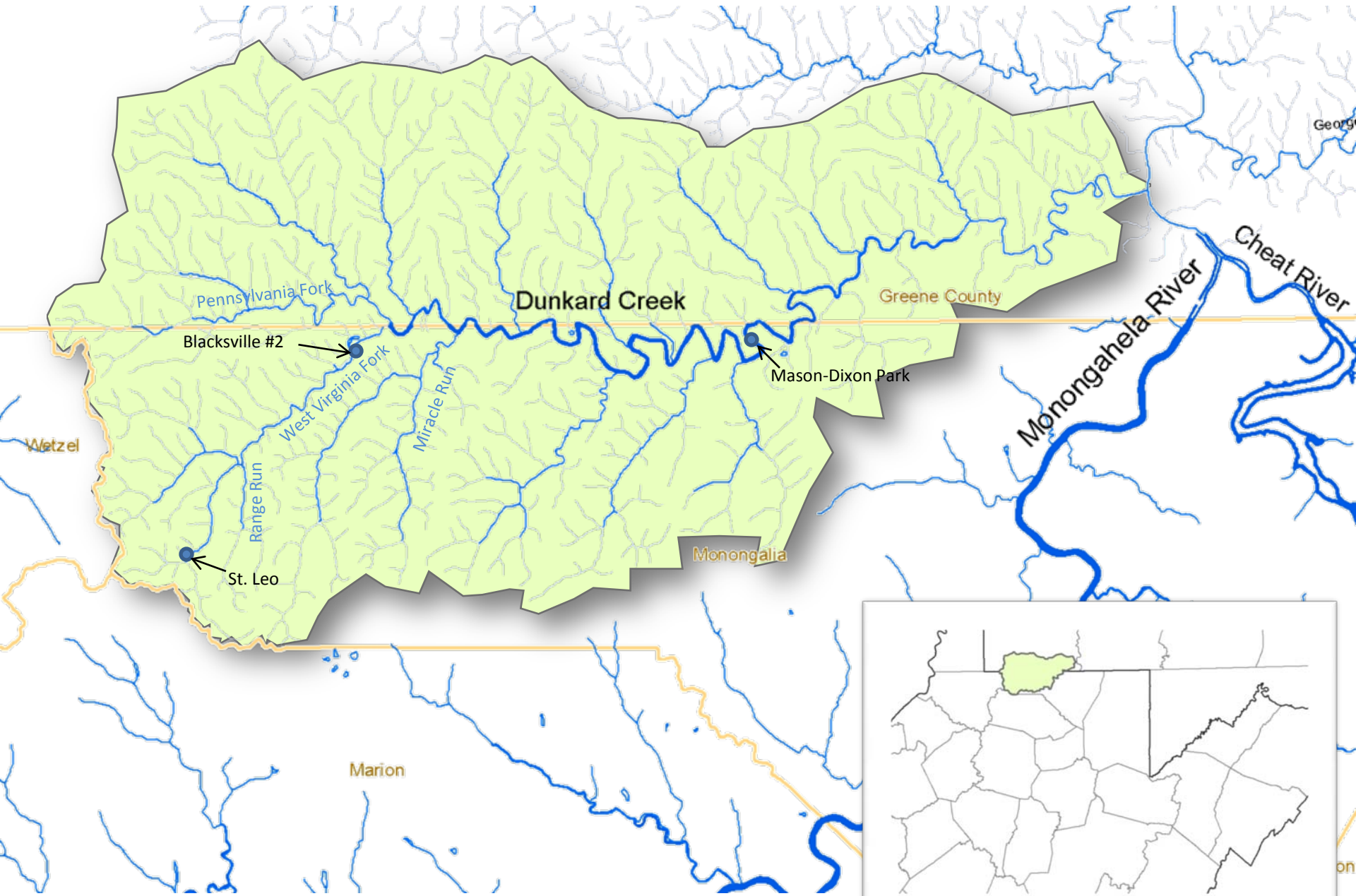


**Patrick Campbell, WVDEP-DWWM**

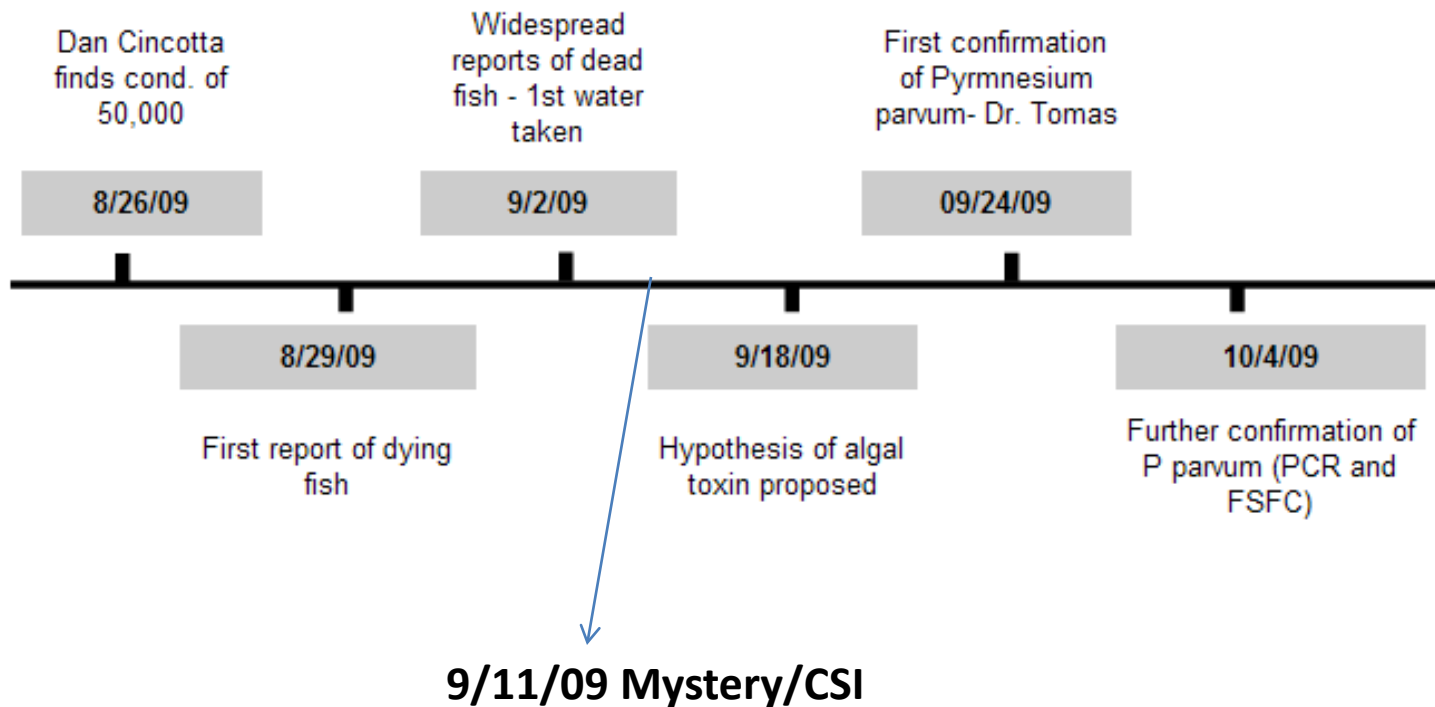
**December 3rd, 2009**

# Progression

- **Brief Look at Historic Data**
- **Golden Algae Information**
- **Next Steps**



## Timeline of Dunkard Creek Aquatic Life Kill Investigation



## 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

\* Blacks ville #2 pumping ceased 9/17/09

# Dunkard Creek Ambient Site Data 1999 to present

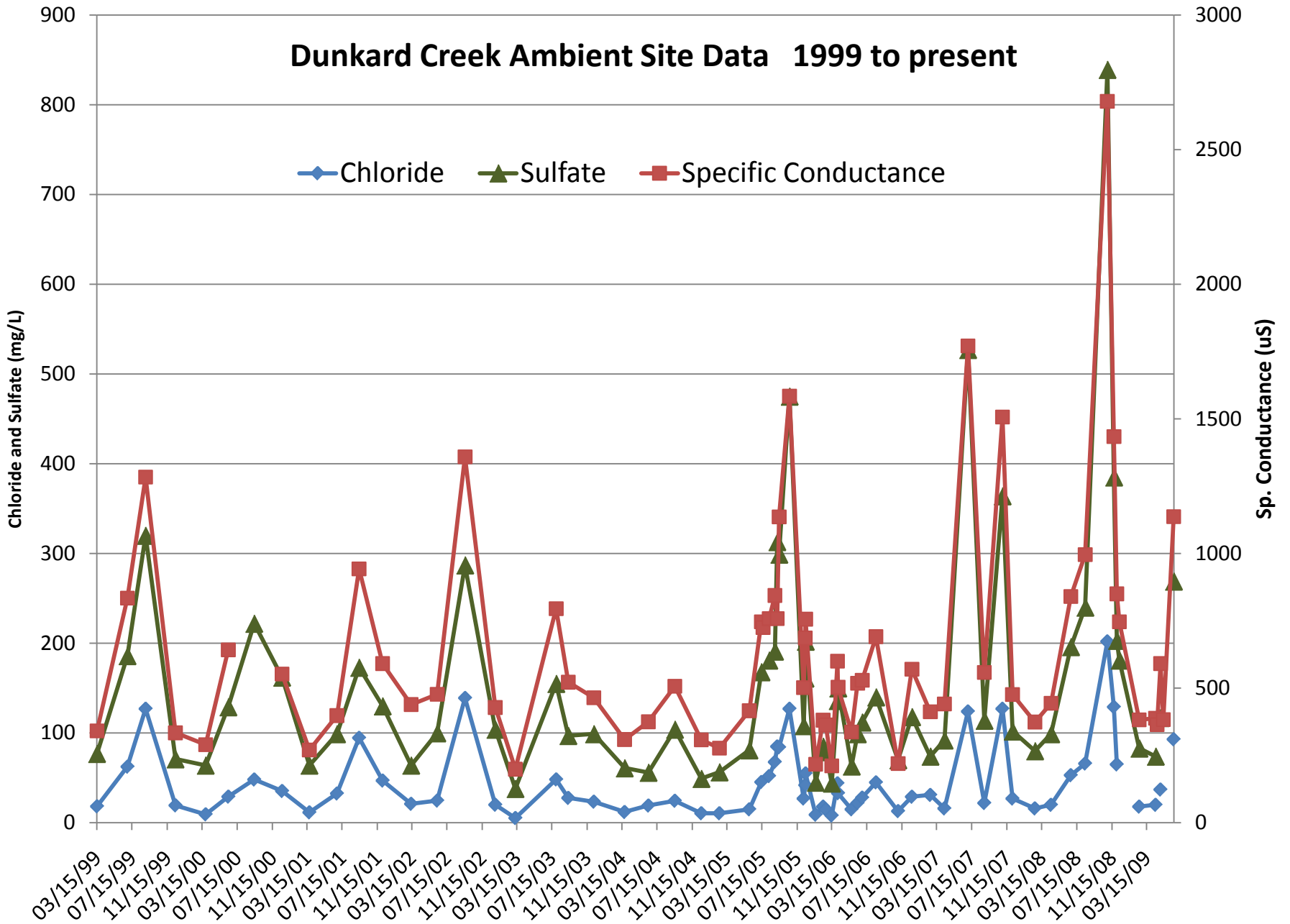




Photo – WVDEP Jeff Bailey DOH Garage 9/18/0

# Algae information collected by Consol

- Data on web [www.wvdep.org/dwwm/dunkard](http://www.wvdep.org/dwwm/dunkard)

Algae screening samples from WV/PA  
 Clemson University  
 Project Number 09-0408  
 Contact Person: Mindy Armstead

Sampling Date	Samples Received	Sample Name	<i>Prymnesium parvum</i> present	Estimated Cells/mL*
11/12/09	11/13/2009	Dunkard at Beal Rd.	NO	
11/12/09	11/13/2009	Dunkard DS Dana Mine	NO	
11/12/09	11/13/2009	Dunkard US Dana Mine	Yes	480
11/12/09	11/13/2009	Dunkard at Mount Morris, PA	NO	
11/12/09	11/13/2009	Dunkard below Mason-Dixon	Yes	320
11/12/09	11/13/2009	Dunkard at Pentress, WV	Yes	160
11/12/09	11/13/2009	Dunkard behind CBHS	Yes	160
11/12/09	11/13/2009	Miracle Run at Bula, WV	NO	
11/12/09	11/13/2009	St Leo DS AMD Plant	NO	
11/12/09	11/13/2009	WV Fork at Wadestown, WV	NO	
11/12/09	11/13/2009	WV Fork US Outlook 005	NO	
11/12/09	11/13/2009	WV Fork at Outlook 005	NO	
11/12/09	11/13/2009	WV Fork DS Outlook 005	NO	
11/12/09	11/13/2009	PA Fork at Shamrock, PA	NO	
11/12/09	11/13/2009	Dunkard at Brave, PA dam	Yes	480

\*Estimates based on concentrated samples (25:1)



# Algae Expert Meeting

- Held Monday and Tuesday
  - Univ. of Oklahoma, Clemson, Texas Parks and Wildlife, WVDNR, USEPA, PADEP, CONSOL, WVDEP
- Report being produced



# 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



# Algae in Other WV waters

- 39 Locations sampled in October
  - Purposefully chose higher Specific Conductance waters
- Mon Drainage detections in Dunkard, Tenmile, Simpson and Elk Creeks (West Fork)
- Short Creek – Northern Panhandle
- Cabin Creek – Near Charleston (137,306 cells/ml) Follow-up sampling completed
- Need to examine other waters



# Next Steps

- Seeking short and long term plans to make conditions less favorable – complicated
- Daily discussions, EPA engaged
- Short term plan to allow needed mine discharges w/o contributing to algae growth
  - Colder water, higher flows
- Much more monitoring
- Restoration a priority when appropriate



# Thanks for your interest!



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



west virginia department of environmental protection

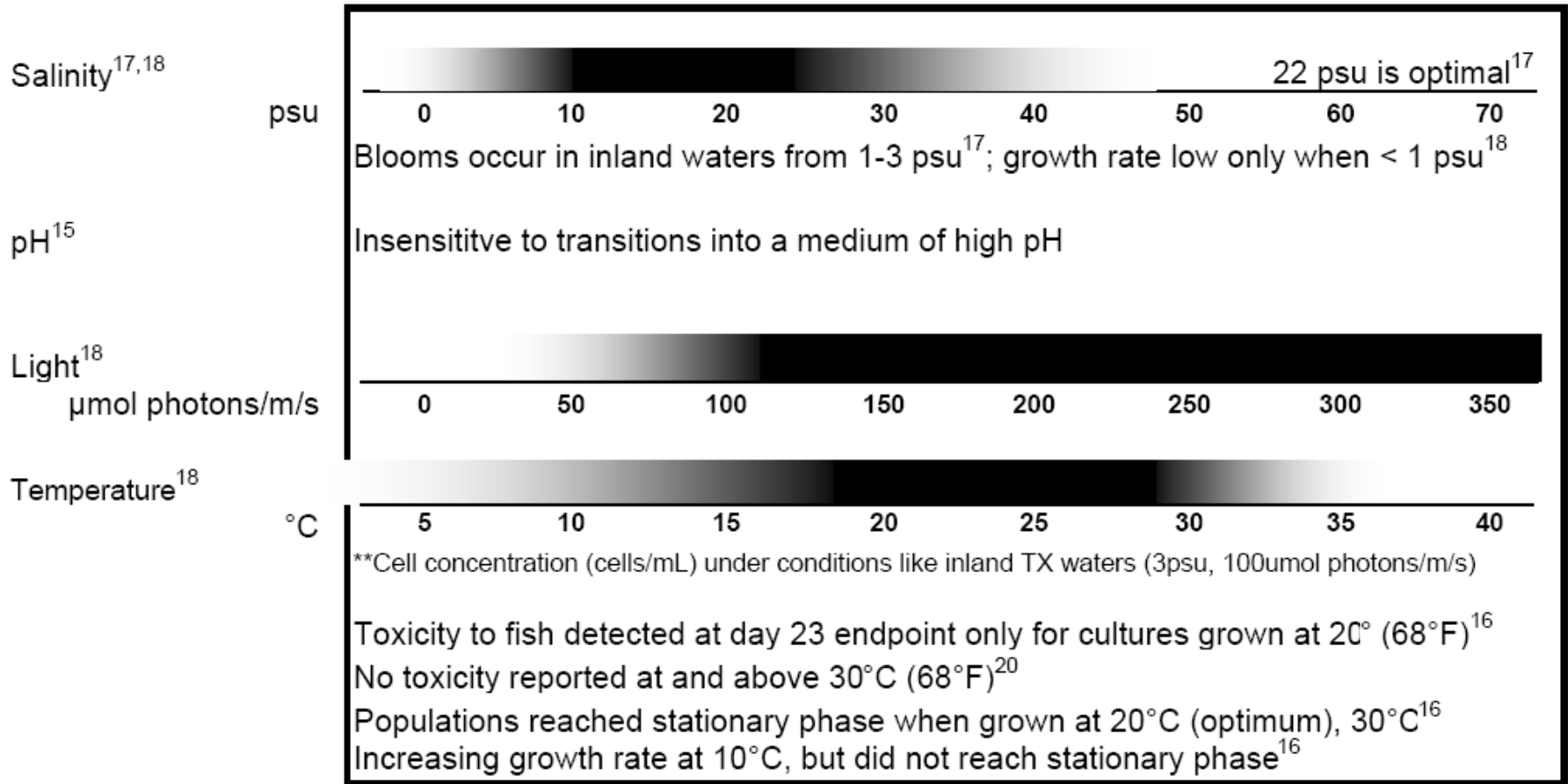




# Wisconsin Information – *Prymnesium parvum*

## 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**

**UBD 460**

Oklahoma – kills 50k+



14/100%