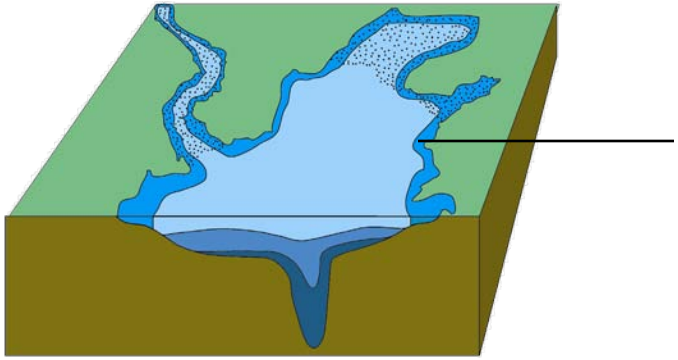
Table 4. Results
Statements of Protectiveness

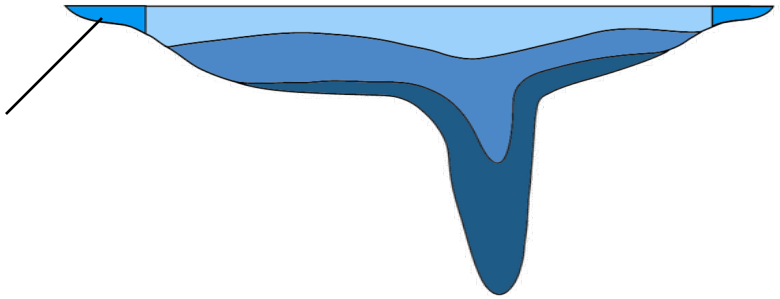
Umbrella Criteria Action Team

March 16, 2011

Shallow Water, nearshore habitat only.

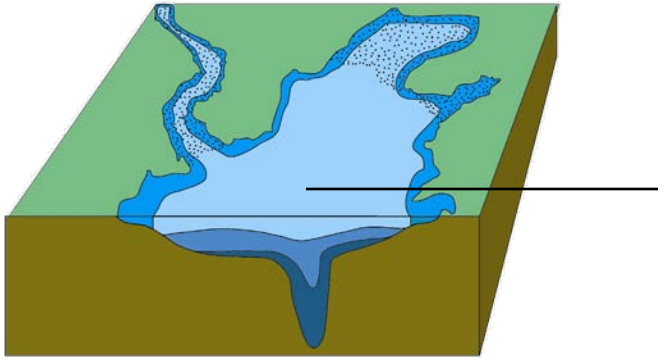


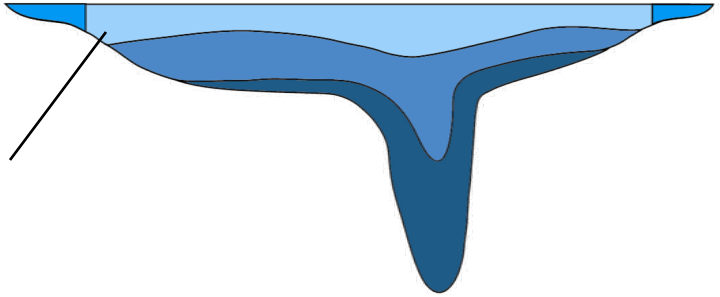
Shallow water



Shallow water, nearshore habitat only				
Author	**Analysis**	**Data**	**Is the 30-day mean protective of…**	
			7-day mean?	**Instantaneous minimum**
Buchanan	Frequencies of failure for short duration open water designated use summer criteria	Data specific analysis Potomac River ConMon data only	General Support	Little protection. Violations of instantaneous minimum criteria per month range from 0% - 60.4% and 65.4% of the months sampled had IM violations of some degree.
Perry	Risk analysis. The probability analysis provided a risk assessment given the statistical properties of residuals for short term criteria means against the monthly mean criterion.	Generalized analysis	Support. Small risk of violation if the data are near the criteria threshold	Not assessed
Boynton et al.	Frequencies of failure for criteria evaluated across the range of open water designated use summer criteria. Violation tables and plots were produced.	Non-Potomac River data across salinity zones, nutrient gradient and duration (years) of monitoring.	Occasional failures observed	Common failures observed. Generally fewer failures at better quality sites. High interannual variability.

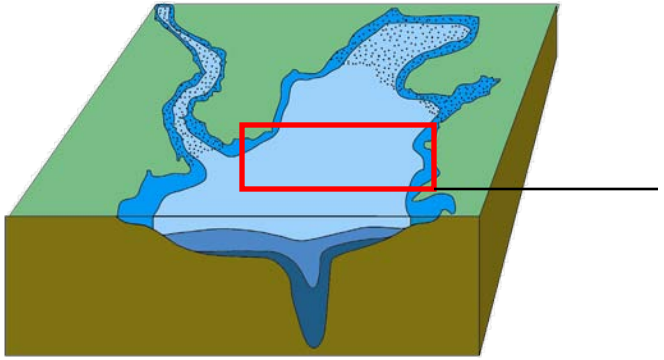
Open Water, Offshore habitat only

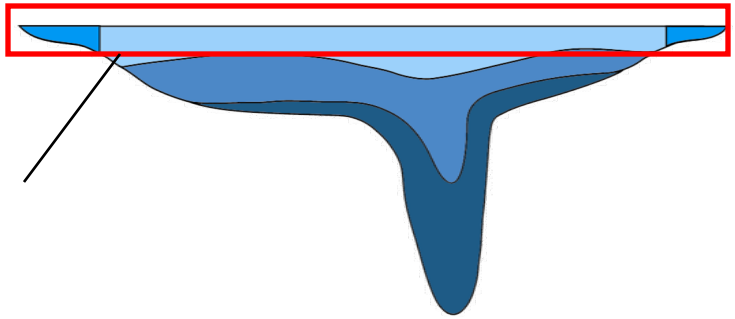




Open Water (Offshore habitat only)				
Author	**Analysis**	**Data**	**Is the 30-day mean protective of…**	
			7-day mean?	**Instantaneous minimum?**
Brush et al.	Time series single location against criteria.	Vertical profiler time series	Support	Questioned, may be protective
Bilkovic (VADEQ)	Comparative analyses in progress	Vertical profiler time series	General support	General support
USEPA 2004	Bi-plots assessing violations		Support	The protection rate was 85% of cases tested (n=94)
Hall	1. Synthetic data for two lower Potomac mid-channel sites 2. Synthetic data from sampled vertical profiler	1. Synthetic data from two locations in mesohaline Potomac River 2006-2008. 2. Synthetic data from vertical profiler and two continuous monitors in mesohaline Potomac River 2009.	1. Support 2. Support above pycnocline (inferred).	1. Common failures observed. 2. Common failures above pycnocline (inferred).

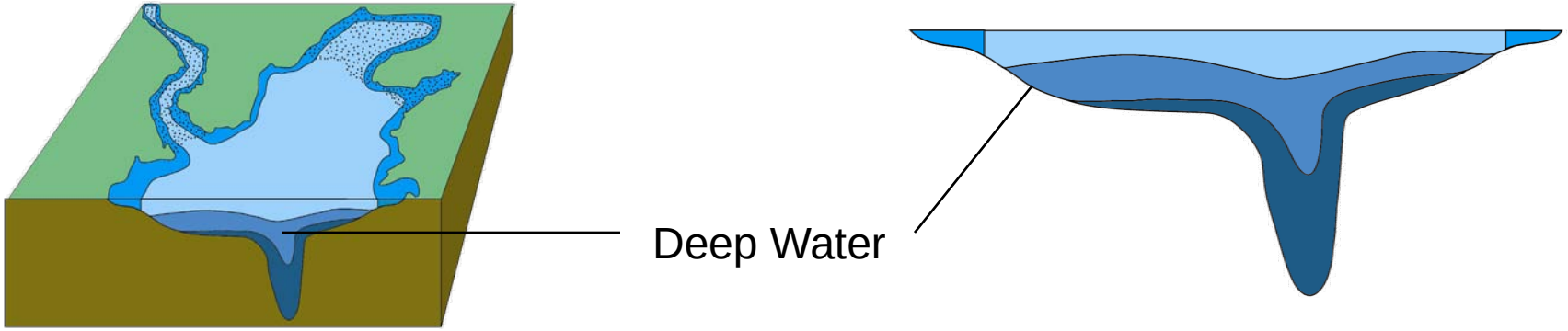
Open water as a designated use





Open Water Designated Use (Regulatory definition, i.e. shoreline to shoreline)				
Author	**Analysis**	**Data**	**Is the 30-day mean protective of…**	
			7-day mean?	**Instantaneous minimum?**
Hall	Combined shallow water open water data with spectral casting. Synthetic data time series.		In progress	In progress or not assessed
Robertson and Lane	Recreated the CFD approach for Open Water criteria assessment on synthetic data interpolated in time and space.		Support (n=12 segs). Violations were detected, not excessive.	Not assessed

Deep Water Habitat



Deep Water habitat only				
Author	**Analysis**	**Data**	**Is the 30-day mean protective of…**	
			1-day mean?	**Instantaneous minimum?**
Brush et al.	Time series single location against criteria.	Vertical profiler time series		
USEPA 2004	Bi-plots assessing violations	short term bouy deployments data sets, e.g. EMAP, etc.		57% of cases tested showed 30-day mean protective on the instantaneous minimum (n=26)
Hall	Synthetic data from sampled vertical profiler.	Synthetic data from vertical profiler and two continuous monitors in mesohaline Potomac River 2009.	General support (inferred).	General support (inferred).

Chesapeake Bay Umbrella Criteria Support Scorecard March 2011	General support	Support but low risk violation (generally <10%)	General Failure >10%	Analyses still in Progress
Open Water 30-day mean protects 7-day mean criterion	7	3	0	Hall
Open Water 30-day mean protects Instantaneous minimum	1	1	5	Hall *Perry
Deep Water 30-day mean protects 1-day mean criterion	1	0	0	
Deep Water 30-day mean protects Instantaneous minimum	1	0	1	

For Open Water (defined as shallow waters plus offshore waters)

- Is the 30-day mean protective of the 7-day mean criterion?
- Is the 30-day mean protective of the instantaneous minimum?
  - Merits, strengths, weaknesses of the analyses?
  - Under what condition(s) is the Umbrella Criteria assumption supported/not supported?
  - What level of confidence can we apply to our conclusions given the evidence?

For Deep Water

- Merits, strengths, weaknesses of the analyses?
- Is the 30-day mean protective of the 1-day mean criterion?
- Is the 30-day mean protective of the instantaneous minimum?
- Under what condition(s) is the Umbrella Criteria assumption supported/not supported?
- What level of confidence can we apply to our conclusions given the evidence?

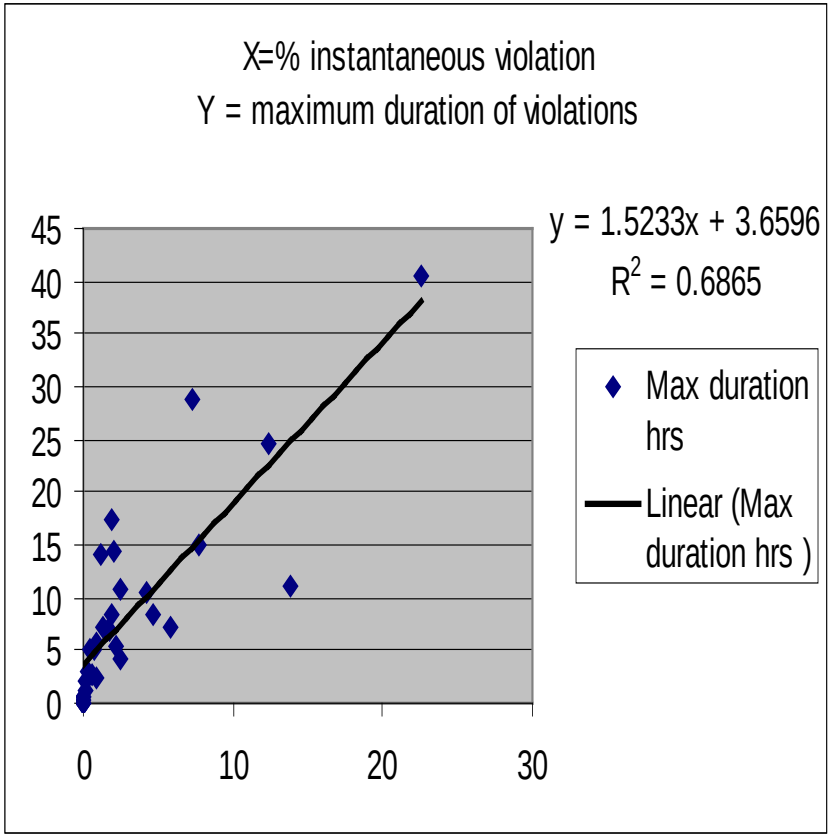
Possible statement starters…

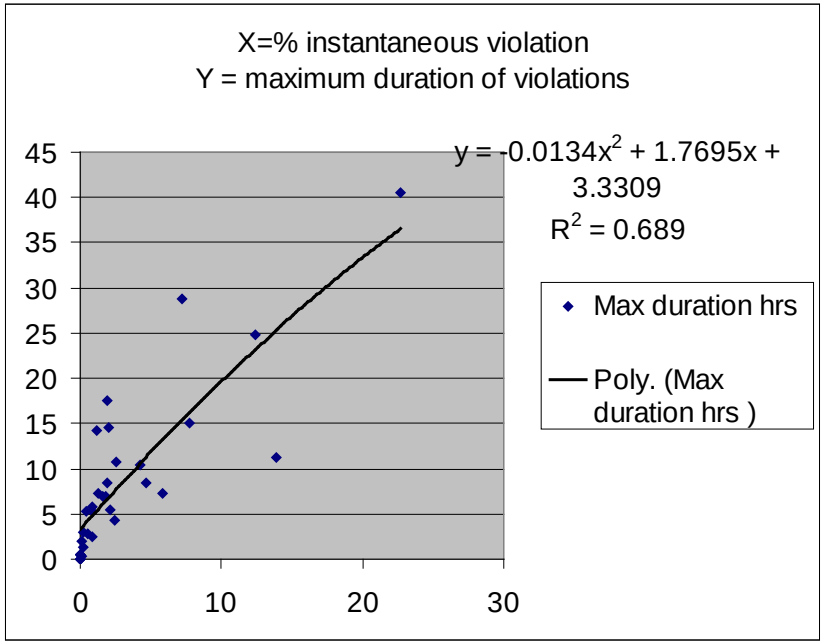
Spectral Casting application statement

- Given the presence of a fixed monitoring station and a ConMon within Xkm, apply Spectral casting to generate high frequency data for the low frequency site to be used in interpolations for short term criteria assessments (e.g. 7-day – not 1 day or instantaneous?).
- Apply spectral casting for 30-day mean to increase sample size to 7-day intervals (?)

Spectral Casting protocol

- Linear interpolation
- Assess with sequential not rolling averages
- Deep water?
- If a Vertical profiler is available instead of a fixed monitoring site?


X=% instantaneous violation
Y = maximum duration of violations
y = 1.5233x + 3.6596
R2 = 0.6865
Max duration hrs
Linear (Max duration hrs)
45
40
35
30
25
20
15
10
5
0
0
10
20
30


X=% instantaneous violation
Y = maximum duration of violations
y = -0.0134x2 + 1.7695x + 3.3309
R2 = 0.689
Max duration hrs
Poly. (Max duration hrs)
45
40
35
30
25
20
15
10
5
0
0
10
20
30