

Comparison of BHHI and 303d listing (criteria attainment) methodologies.

*303d listing methodology described here is modified for application to the BHHI (e.g. addition of reporting regions).

BHHI methodology	303d listing methodology
Step 1: Uses salinity and temperature measurements to calculate pycnoclines, using automated code that roughly applies Tom Fisher's standardized methodology for identifying pycnoclines	Step 1: same
	Step 2: Vertically interpolates the vertical profiles to even 1-m depths, beginning at 0.5m
	Step 3: Volumetrically interpolates all data (DO, salinity, pycnoclines), which applies a measurement to each cell in the bathymetry file for which there are data available in the segment (at the given depth)
Step 2: Depending on the depth of each DO measurement and of pycnocline in a particular sampling event (e.g. station/cruise), applies criteria to determine whether measurement passes or fails the criterion. Keeps count of # of passing values, # of failing values, and total # of values for each station. Calculates a % passing for each station.	
Step 3: Sums the %passing/failing from all stations in a segment to get a %passing score for the segment	Step 4: Depending on the depth of each DO measurement and of pycnocline in a particular sampling event (e.g. station/cruise), applies criteria to determine whether measurement passes or fails the criterion. Keeps count of # of passing cells, # of failing cells, # of assessed cells, and total # of cells for each segment. Calculates a % failed for each segment (failed volume/assessed volume).
At this point, the 2 analyses provide similar results.	
	Step 5: Compares the failure rate to our bioreference curves. If more than an "acceptable" amount of failure has occurred, then flags the entire volume of the designated use as "failed". It is this step alone which accounts for the large discrepancy between the 2 analyses.
Step 4: For each reporting region, calculates an area-weighted % passing score (sum of % passing for segments, after correcting each segment's score (%passing*Seg_area/Reg_area	Step 6: For each reporting region, calculates an area-weighted % passing score by area-weighting and summing % passing scores of all segments for each reporting region
Step 5: Sums regional %passing values into a bay-wide % passing score	Step 7: Sums regional %passing values into a bay-wide % passing score

20 year annual analysis comparing 2 methodologies (result for entire bay):

Year	BHHI % above criterion	303d listing % above criterion	303d listing % passing
1985	85.76	84.85	16.08
1986	80.97	81.51	11.18
1987	78.04	78.90	17.58
1988	83.21	82.33	18.96
1989	76.91	78.40	9.86
1990	78.15	80.78	11.71
1991	78.66	80.24	11.20
1992	85.01	82.99	25.19
1993	77.85	78.77	21.60
1994	80.78	80.60	26.28
1995	81.80	82.40	8.09
1996	79.15	78.56	26.86
1997	84.59	84.38	34.03
1998	78.14	78.09	27.74
1999	83.11	83.16	23.80
2000	83.09	82.61	26.40
2001	82.55	83.88	18.13
2002	85.67	84.53	32.83
2003	73.86	76.97	8.90
2004	82.78	83.23	36.12
2005	73.12	76.40	9.94
2006	83.13	83.09	37.24