

## Comparison of Teacher Post-MWEE Initial vs. Nonresponse Questionnaire Results

This document compares responses from teachers who responded to the initial post-MWEE questionnaire with the responses from teachers who responded to a follow up non-response post-MWEE questionnaire. Chi square tests were conducted when the response choices were nominal (e.g., yes/no or categorical) and independent t-tests were conducted when response choices were ordinal (e.g., 1-5 point Likert-type). P values are reported to indicate if initial (MWEE) and non-respondent (NR) teachers' responses are statistically significantly different ( $p < .05$ ). Post hoc tests were completed when chi square tests showed statistical significant differences to determine where the differences occurred (Bonferroni method to compare column proportions).

Note:

- The numbers in parentheses immediately following the response choices, such as (55), (1), (0), are the values assigned to each response.
- Respondents who did not participate in MWEE PD, were not teachers, or did not teach in a public or private school were excluded from these analyses [SPSS selection syntax MPDQ6 ~= 55 & MPDQ3 = 1 & (MPDQ5rev = 1 | MPDQ5rev=2)]

**MPDQ6** How long ago did you complete professional development focused on watersheds or water quality issues (also known as a Meaningful Watershed Educational Experience professional development or MWEE PD)?

- I did not complete a MWEE PD. (55) → Exit from survey, not included in these analyses
- Less than a year ago (8)
- A year or more ago (9)

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	5.909	1	.015

Crosstab						
				Group		Total
				MWEE	NR	
MPDQ6	8	Count	254 <sub>a</sub>	59 <sub>b</sub>	313	
		% within Group	<b>57%</b>	<b>45%</b>	54%	
	9	Count	194 <sub>a</sub>	73 <sub>b</sub>	267	
		% within Group	<b>43%</b>	<b>55%</b>	46%	
Total		Count	448	132	580	
		% within Group	100%	100%	100%	

Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.

**MPDQ3** Are you currently a PreK-12 teacher or educator?

- No (0) → Exit from survey, not included in these analyses
- Yes (1)

No analysis.

**MPDQ5rev** In what setting do you teach primarily? (select one)

- Public school (1)

- Private school (2)
- Non-formal education (e.g., environmental centers, zoos, museums, interpretive programs at local or state level parks, youth organizations, summer camps, after school programs) (3) → Exit from survey, not included in these analyses
- Home-school (4) → Exit from survey, not included in these analyses Other (88) → Exit from survey, not included in these analyses

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	5.230	1	.022

Crosstab						
				Group		Total
				MWEE	NR	
MPDQ5rev	1	Count	424 <sub>a</sub>	131 <sub>b</sub>	555	
		% within Group	<b>95%</b>	<b>99%</b>	96%	
	2	Count	24 <sub>a</sub>	1 <sub>b</sub>	25	
		% within Group	<b>5%</b>	<b>1%</b>	4%	
Total	Count	448	132	580		
	% within Group	100%	100%	100%		

Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.

**MPDGQ1** In which region did you teach this past year? (check one)

- **California** (1)
- **Chesapeake Bay watershed** (Maryland, Virginia, Delaware, West Virginia, Pennsylvania, New York, and the District of Columbia) (2)
- **Great Lakes** (Ohio, Michigan, Indiana, Illinois, Minnesota, Wisconsin, New York, and Pennsylvania) (3)
- **Gulf of Mexico** (Texas, Louisiana, Mississippi, Alabama, and Florida) (4)
- **Hawaii** (5)
- **New England** (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island) (6)
- **Pacific Northwest** (Oregon and Washington) (7)
- **Other** (please describe) (88) \_\_\_\_\_

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	19.186	7	.008

Crosstab						
				Group		Total
				MWEE	NR	
MPDGQ1	1	Count	24 <sub>a</sub>	11 <sub>a</sub>	35	
		% within Group	5%	8%	6%	
	2	Count	175 <sub>a</sub>	67 <sub>b</sub>	242	
		% within Group	<b>40%</b>	<b>51%</b>	42%	

	3	Count	18 <sub>a</sub>	8 <sub>a</sub>	26	
		% within Group	4%	6%	5%	
	4	Count	72 <sub>a</sub>	15 <sub>a</sub>	87	
		% within Group	16%	11%	15%	
	5	Count	69 <sub>a</sub>	5 <sub>b</sub>	74	
		% within Group	<b>16%</b>	<b>4%</b>	13%	
	6	Count	43 <sub>a</sub>	11 <sub>a</sub>	54	
		% within Group	10%	8%	9%	
	7	Count	36 <sub>a</sub>	14 <sub>a</sub>	50	
		% within Group	8%	11%	9%	
	88	Count	6 <sub>a</sub>	1 <sub>a</sub>	7	
		% within Group	1%	1%	1%	
	Total		Count	443	132	575
			% within Group	100%	100%	100%
Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.						

**MQ9** In the past 12 months, did you implement a Meaningful Watershed Educational Experience (MWEE) with your students?

- No (0) →Exit from survey
- Yes (1)

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	11.648	1	.001

Crosstab					
			Group		Total
			MWEE	NR	
MQ9	0	Count	83 <sub>a</sub>	44 <sub>b</sub>	127
		% within Group	<b>19%</b>	<b>33%</b>	22.5%
	1	Count	350 <sub>a</sub>	88 <sub>b</sub>	438
		% within Group	<b>81%</b>	<b>67%</b>	77.5%
Total		Count	433	132	565
		% within Group	100.0%	100.0%	100.0%
Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.					

**MGQ37\_1** How many of your students participated in a MWEE during the most recent school year? (Please provide your best estimate, NOT a range)

- About \_\_\_ students (1) \_\_\_\_\_

	Group	N	Mean	Std. Deviation	Std. Error Mean	t-test (p)
MPDQ37_1	NR	82	78.7	50.908	5.621	.483

	MWEE	348	60.0	240.561	12.895	
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**MGQ45rev** On average, did students participate in a MWEE over the course of:

- Less than a week (1)
- A week (2)
- Multiple weeks (3)
- Multiple months (4)
- A full school year (5)
- Multiple years (6)

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	2.722	5	.743

**MGQ43rev** On average during the last school year, about how many hours did a typical student spend involved in MWEE activities? (check one)

- 1-5 hours (1)
- 6-9 hours (2)
- 10-24 hours (3)
- 25-40 hours (4)
- More than 40 hours (5)

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	15.483 <sup>a</sup>	4	.004

Crosstab					
			Group		Total
			MWEE	NR	
MGQ43rev	1	Count	76 <sub>a</sub>	31 <sub>b</sub>	107
		% within Group	<b>22%</b>	<b>37%</b>	25%
	2	Count	83 <sub>a</sub>	23 <sub>a</sub>	106
		% within Group	24%	27%	25%
	3	Count	122 <sub>a</sub>	19 <sub>b</sub>	141
		% within Group	<b>36%</b>	<b>22%</b>	33%
	4	Count	40 <sub>a</sub>	12 <sub>a</sub>	52
		% within Group	12%	14%	12%
	5	Count	23 <sub>a</sub>	0 <sub>b</sub>	23
		% within Group	<b>7%</b>	<b>0%</b>	5%
Total		Count	344	85	429
		% within Group	100%	100%	100%

Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.

**MGQ44rev** On average during the last school year, about how many hours did a typical student spend outdoors during MWEE activities? (check one)

- None (0)
- 1-5 hours (1)
- 6-9 hours (2)
- 10-24 hours (3)
- 25-40 hours (4)
- More than 40 hours (5)

Chi-Square Tests			
	Value	df	p
Pearson Chi-Square	13.886 <sup>a</sup>	5	.016

Crosstab						
			Group		Total	
			MWEE	NR		
MGQ44rev	0	Count	14 <sub>a</sub>	7 <sub>a</sub>	21	
		% within Group	4%	8%	5%	
	1	Count	164 <sub>a</sub>	53 <sub>b</sub>	217	
		% within Group	<b>48%</b>	<b>62%</b>	51%	
	2	Count	92 <sub>a</sub>	10 <sub>b</sub>	102	
		% within Group	<b>27%</b>	<b>12%</b>	24%	
	3	Count	49 <sub>a</sub>	12 <sub>a</sub>	61	
		% within Group	14%	14%	14%	
	4	Count	18 <sub>a</sub>	3 <sub>a</sub>	21	
		% within Group	5%	4%	5%	
	5	Count	7 <sub>a</sub>	0 <sub>a</sub>	7	
		% within Group	2%	0%	2%	
	Total		Count	344	85	429
			% within Group	100%	100%	100%

Each subscript letter denotes a subset of Group categories whose column proportions do not differ significantly from each other at the .05 level.

**MGQ52rev** As a result of participating in MWEEs, students:

	NA	Strongly disagree						Strongly agree
	1	2	3	4	5	6	7	8
Know more about the ocean (MGQ52_13)								
Know more about climate change (MGQ52_14)								
Know more about watersheds (MGQ52_1)								
Express greater caring and concern for their local watershed (ocean, coastal, riverine, estuarine, Great Lakes) (MGQ52_2)								
Are more confident in their ability to protect or restore watersheds (MGQ52_3)								
Are more likely to act to protect or restore watersheds (MGQ52_4)								

Are better able to make informed decisions about how to protect or restore watersheds (MGQ52_5)								
Are better able to conduct scientific investigations (MGQ52_6)								
Are better able to understand the nature of scientific research (MGQ52_7)								
Are more likely to express an interest in pursuing science careers (MGQ52_8)								
Perform better in science (MGQ52_9)								
Perform better on state standardized tests (MGQ52_11)								
Are more engaged in their learning (MGQ52_12)								

<b>Independent t-tests</b>						
	Group	N	Mean	Std. Deviation	Std. Error Mean	p
MGQ52rev_MGQ52_13	MWEE	337	7.16	9.731	.530	.252
	NR	81	8.65	13.274	1.475	
MGQ52rev_MGQ52_14	MWEE	335	7.02	9.777	.534	.514
	NR	81	7.85	12.270	1.363	
MGQ52rev_MGQ52_1	MWEE	333	6.51	4.772	.262	.416
	NR	80	6.08	1.290	.144	
MGQ52rev_MGQ52_2	MWEE	335	6.54	5.467	.299	.913
	NR	81	6.47	5.581	.620	
MGQ52rev_MGQ52_3	MWEE	337	5.96	4.852	.264	.911
	NR	81	6.02	5.657	.629	
MGQ52rev_MGQ52_4	MWEE	337	6.23	5.509	.300	.878
	NR	81	6.12	5.631	.626	
MGQ52rev_MGQ52_5	MWEE	336	6.78	7.151	.390	.115
	NR	80	5.51	1.283	.143	
MGQ52rev_MGQ52_6	MWEE	336	6.79	7.664	.418	.842
	NR	80	6.60	7.891	.882	
MGQ52rev_MGQ52_7	MWEE	335	6.88	8.120	.444	.778
	NR	80	6.60	7.888	.882	
MGQ52rev_MGQ52_8	MWEE	336	6.70	8.136	.444	.821
	NR	80	6.48	7.919	.885	
MGQ52rev_MGQ52_9	MWEE	336	7.33	9.275	.506	.841
	NR	81	7.10	9.523	1.058	
MGQ52rev_MGQ52_11	MWEE	336	11.66	16.907	.922	.765
	NR	81	11.04	16.656	1.851	
MGQ52rev_MGQ52_12	MWEE	336	6.51	4.749	.259	.892
	NR	81	6.43	5.590	.621	

## Summary of Results

	<b>MWEE (n)</b>	<b>NR (n)</b>	<b>Statistical significant difference</b>	<b>Meaningful difference</b>
How long ago PD	448	132	yes	no
PreK-12 Teacher or educator	448	132	NA	NA
Setting	448	132	yes	no
Region	443	132	yes	no
MWEE in last 12 months	433	132	yes	yes
Number of students	348	82	no	no
MWEE weeks/months	346	85	no	no
MWEE hours total	344	85	yes	yes
MWEE hours outdoors	344	85	yes	yes
Outcome – know about ocean	337	81	no	no
Outcome – know about climate change	335	81	no	no
Outcome – know about watershed	333	80	no	no
Outcome – concern for watershed	335	81	no	no
Outcome – confident as steward	337	81	no	no
Outcome – likely to act as steward	337	81	no	no
Outcome – able to make decisions	336	80	no	no
Outcome – able to do scientific investigations	336	80	no	no
Outcome – understand scientific research	335	80	no	no
Outcome – interest in science career	336	80	no	no
Outcome – science performance	336	81	no	no
Outcome – standardized tests	336	81	no	no
Outcome – engaged in learning	336	81	no	no