Environmental Indicators Through 2010

September 2011

Introduction and Background

The North Carolina Division of Water Quality (NCDWQ) operates a state-wide ambient monitoring network which measures the concentrations of a variety of parameters. Currently, measurements are obtained monthly from 323 monitoring stations for parameters including dissolved oxygen, turbidity, and fecal coliform bacteria. Many other parameters such as pH, specific conductance, nutrients and chlorophyll-a are also monitored. A general perspective of water quality changes can be obtained by looking graphically at dissolved oxygen, turbidity, and fecal coliform data. These water quality variables are particularly useful because there have been no significant changes in sampling or analysis techniques. Active ambient monitoring sites can be found here: http://portal.ncdenr.org/web/wq/ess/eco/ams.

Results for dissolved oxygen, turbidity, and fecal coliform bacteria were grouped by region (mountains, piedmont, and coastal plain) and graphed to depict the percentage of measurements that exceed water quality evaluation levels changed over time. (decadal[1], yearly). These graphs are based on the results from 172 currently active NCDWQ monitoring stations that were established before 1979. Since the data were collected over many years, the number of results is large enough to indicate changes in dissolved oxygen, turbidly and fecal coliform bacteria over time.

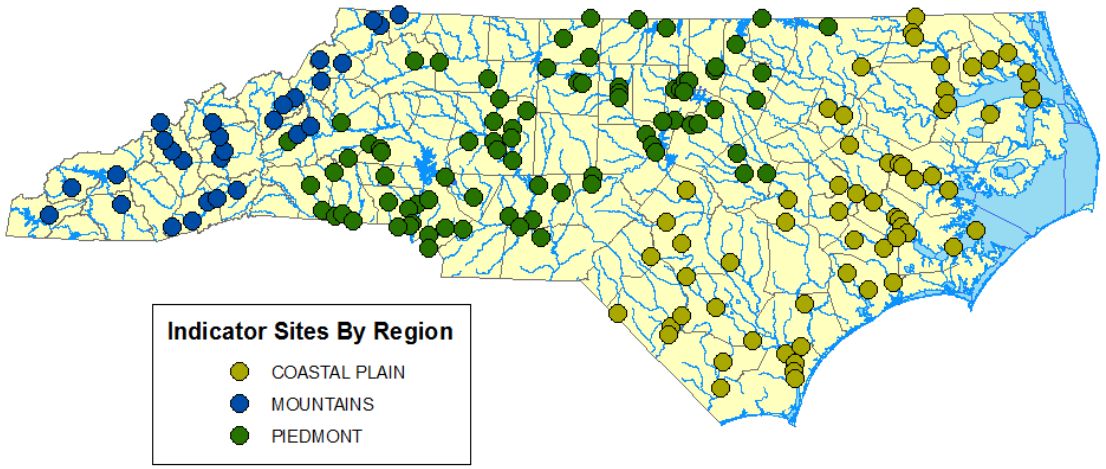


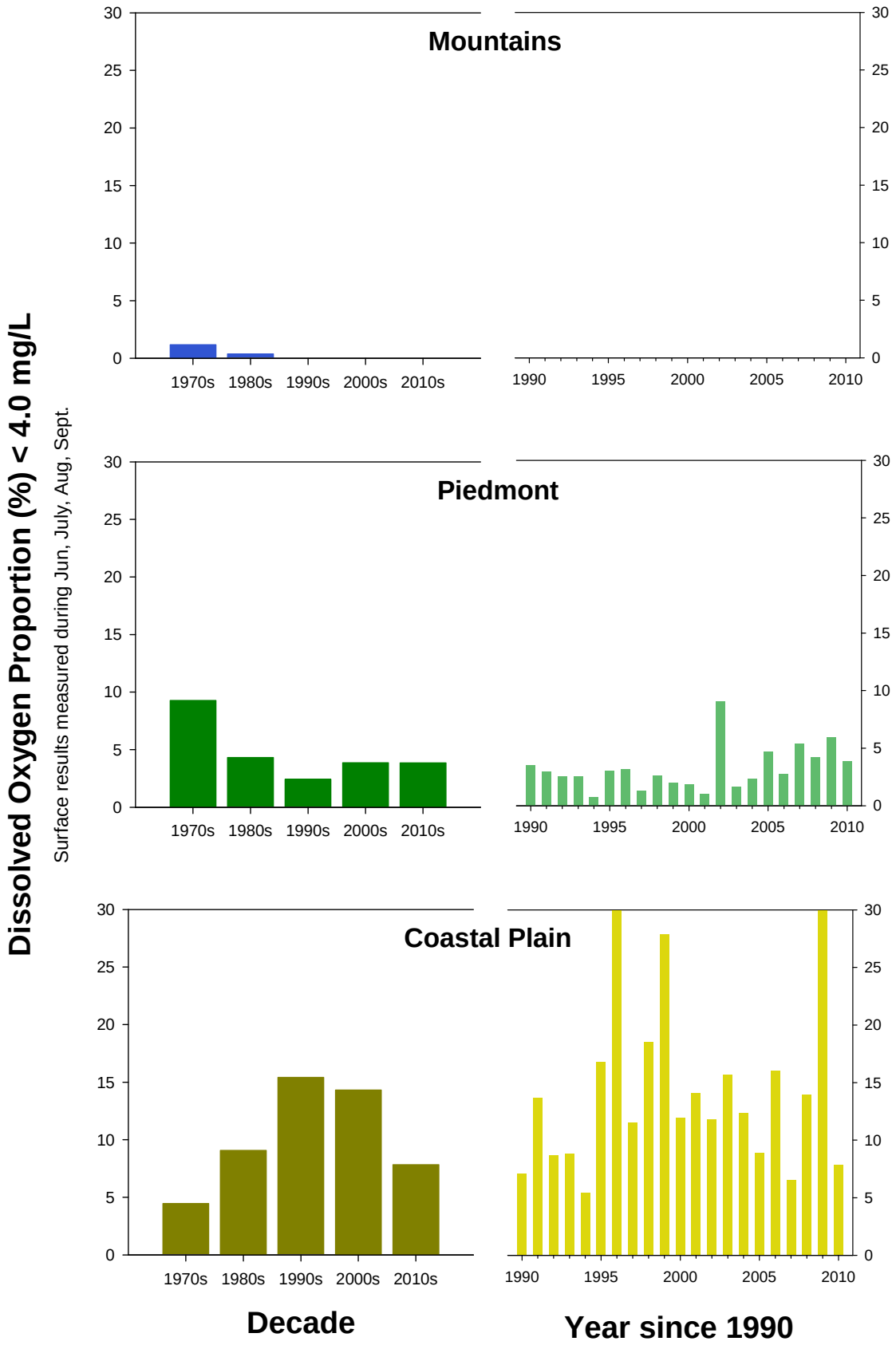
Table 1. Number of Monitoring Stations and Results Used to Prepare Indicator Graphs

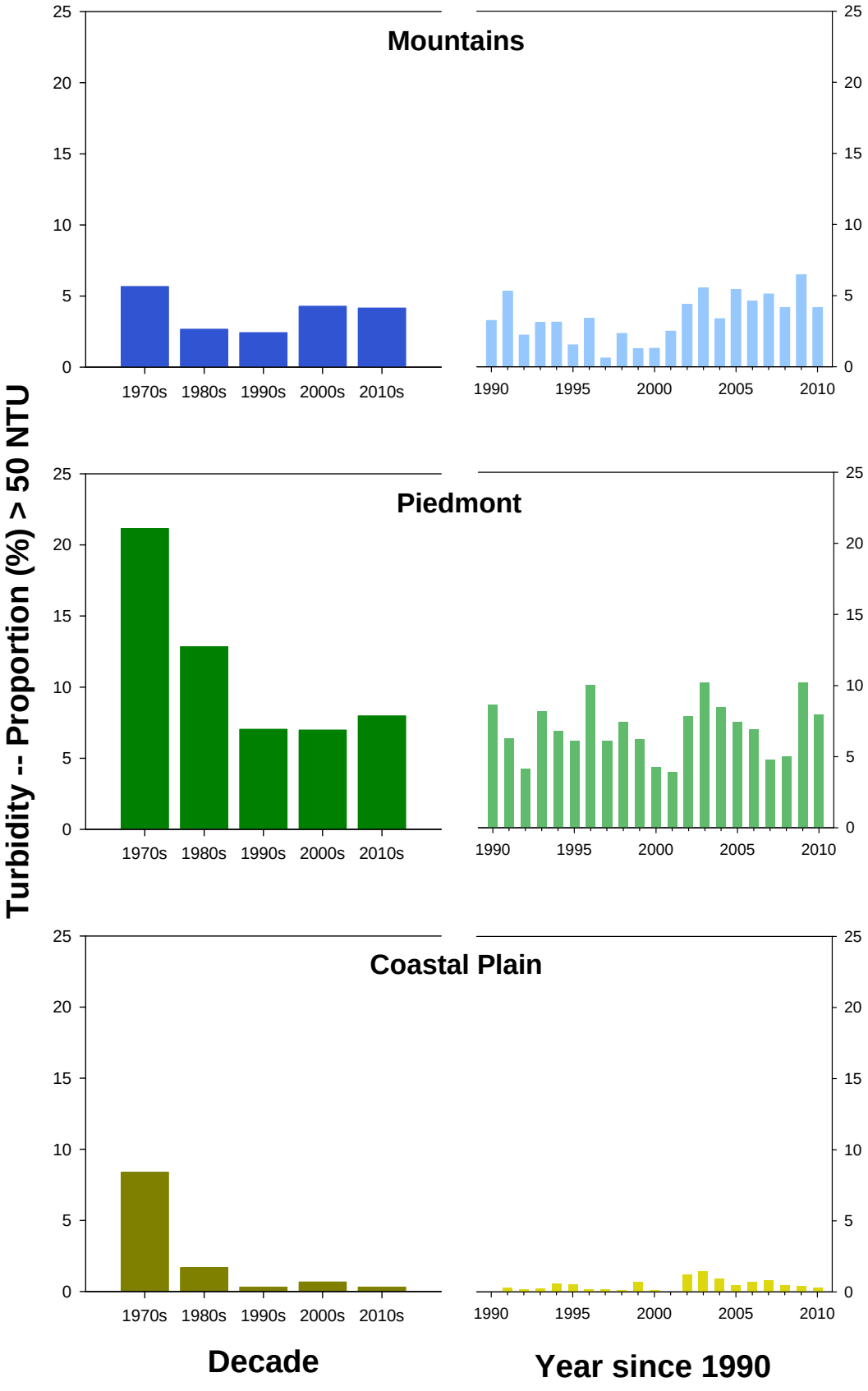
Region	Number of Stations	Number of Results[1]		
		Turbidity	Fecal Coliform Bacteria	Summer Dissolved Oxygen[2]
Coastal Plain	63	16,556	19,289	8,290
Mountains	28	8,395	9,531	3,429
Piedmont	80	21,346	25,339	10,426
Total	**171**	**46,297**	**54,159**	**22,145**

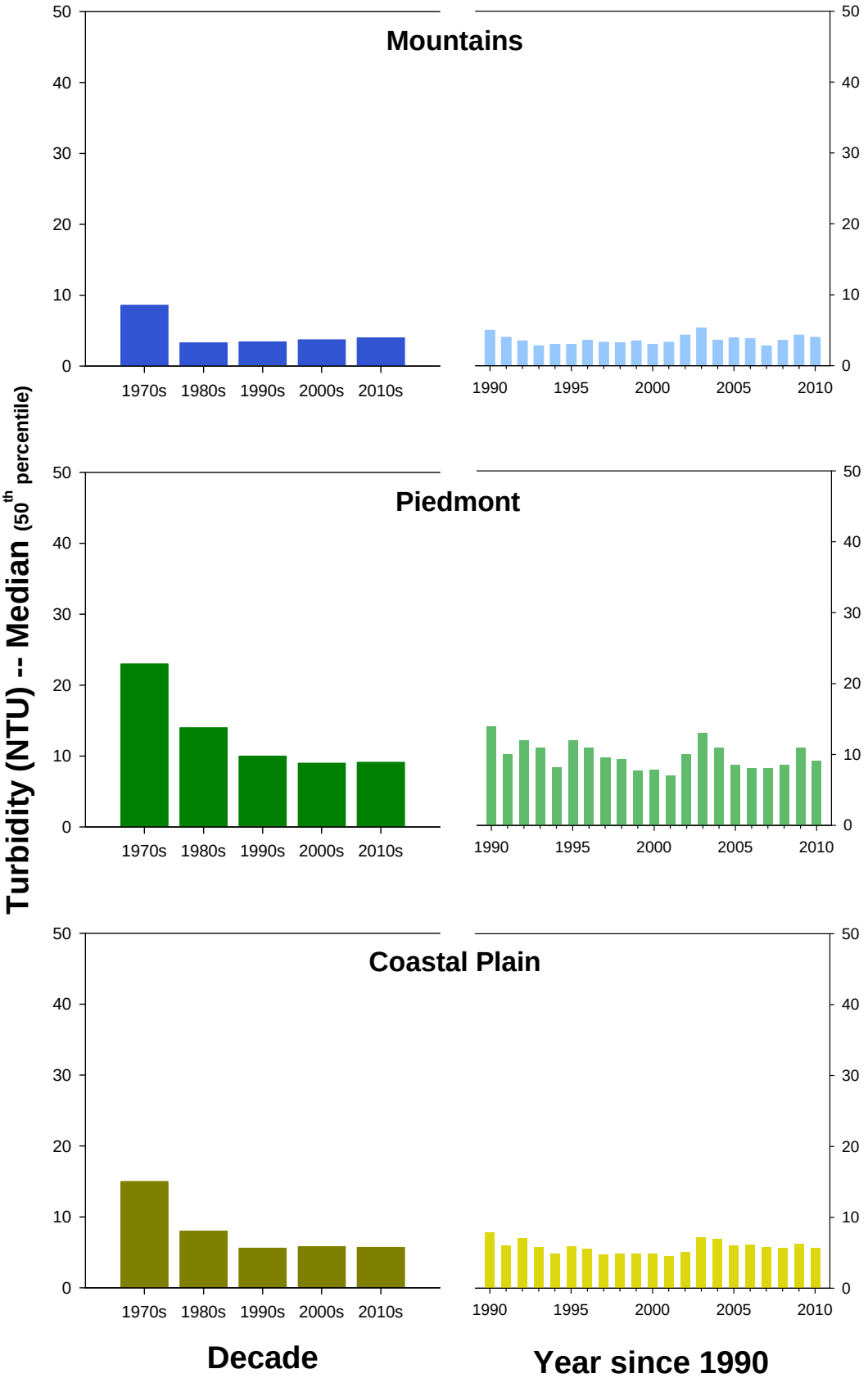
1. Period: January 1970 through December 2010.

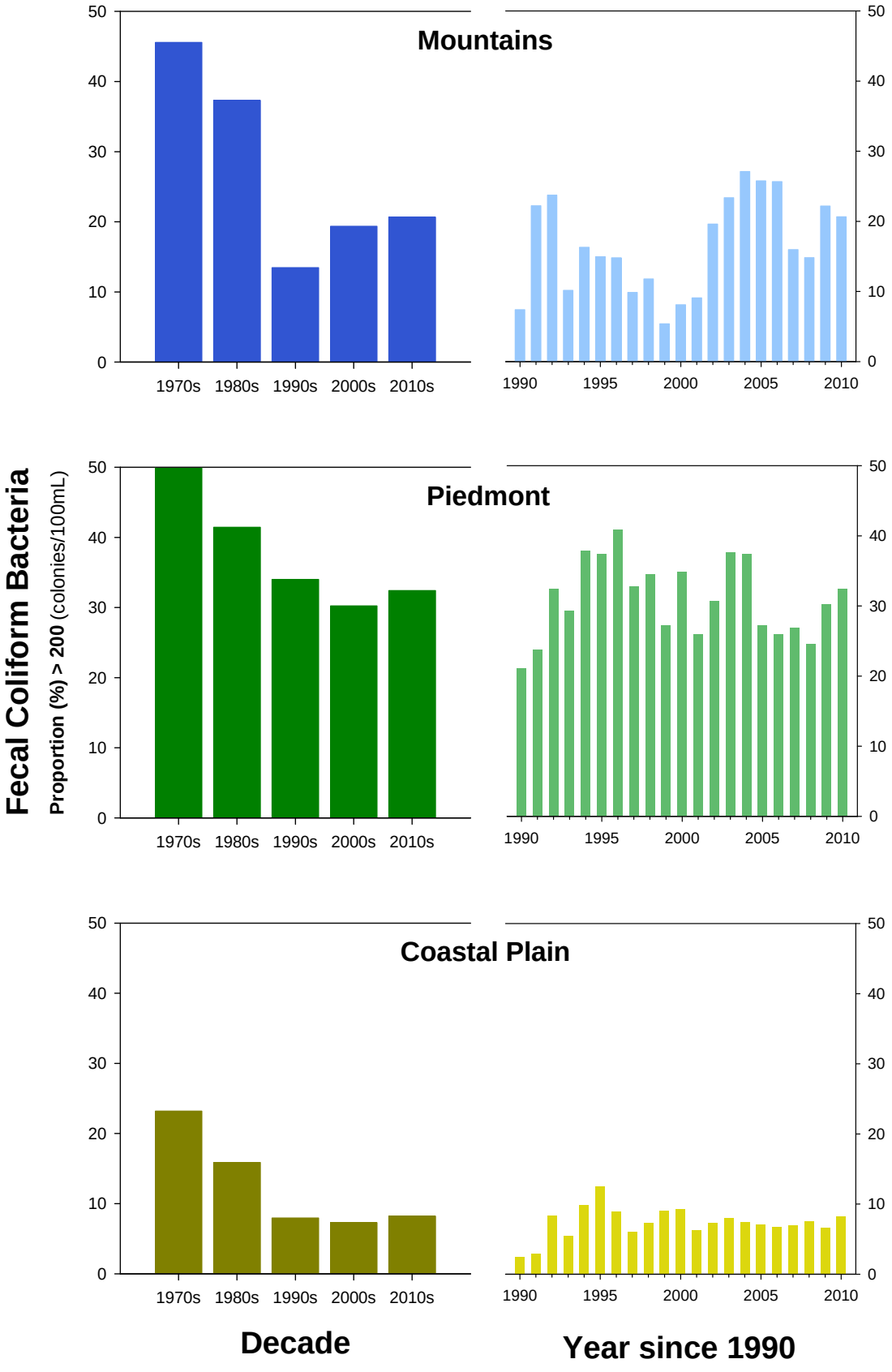
2. Summer is defined as June, July, August, and September. Only surface results (< 1m) were used.

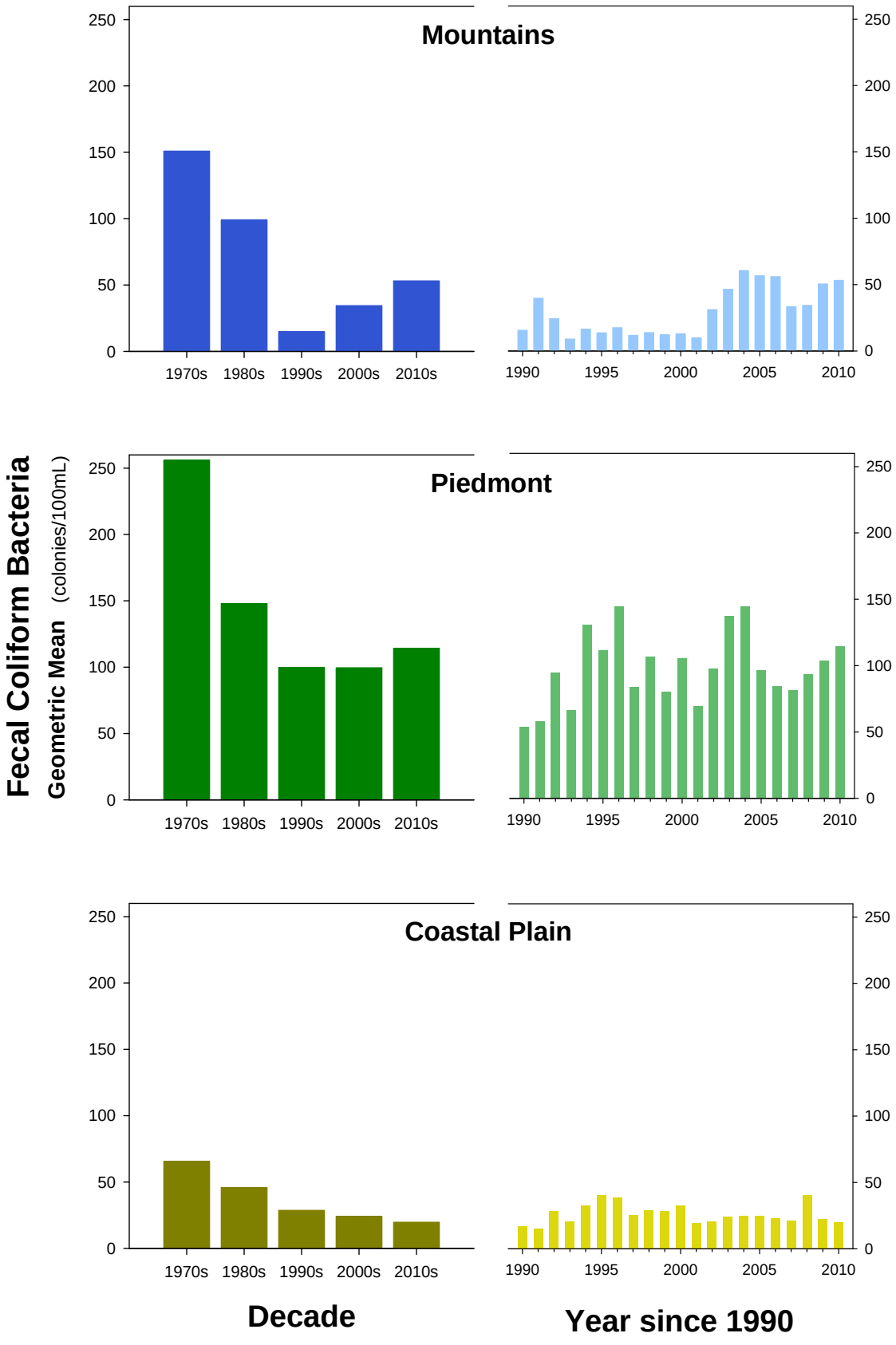
[1] Note that the bars graphs for the decade "2010s" on pages 2-6 represent one year (2010)


Dissolved Oxygen Proportion (%) < 4.0 mg/L
Surface results measured during Jun, July, Aug, Sept.
Mountains
Piedmont
Coastal Plain
30
25
20
15
10
5
0
1970s
1980s
1990s
2000s
2010s
1990
1995
2000
2005
2010
Decade
Year since 1990


Mountains
Piedmont
Coastal Plain
Turbidity -- Proportion (%) > 50 NTU
0
5
10
15
20
25
1970s
1980s
1990s
2000s
2010s
1990
1995
2000
2005
2010
Decade
Year since 1990


Mountains
Piedmont
Coastal Plain
Turbidity (NTU) -- Median (50th percentile)
0
10
20
30
40
50
1970s
1980s
1990s
2000s
2010s
1990
1995
2000
2005
2010
Decade
Year since 1990


Mountains
Piedmont
Coastal Plain
Fecal Coliform Bacteria
Proportion (%) > 200 (colonies/100mL)
0
10
20
30
40
50
1970s
1980s
1990s
2000s
2010s
1990
1995
2000
2005
2010
Decade
Year since 1990


Mountains
Piedmont
Coastal Plain
Fecal Coliform Bacteria
Geometric Mean (colonies/100mL)
250
200
150
100
50
0
1970s
1980s
1990s
2000s
2010s
1990
1995
2000
2005
2010
Decade
Year since 1990