Barrier Island Monitoring

Graph Topographic Changes

Overview
Students will learn about topographical transect monitoring techniques along barrier islands.

Grade Level
6th - 12th

Materials
- colored pencils
- ruler
- graph paper
- lined paper

Time Required
45 minutes

Objectives
Students will use Assateague Island topographical transect data from 1996, 2004, and 2010, to plot three graphs and compare them to see how the topography changes across the island from the bay to the ocean.

National Science Education Standards
Standard A: Science as Inquiry
- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Standard E: Science as Technology
- Understandings about science and technology

Standard F: Science in Personal and Social Perspectives
- Natural resources

Procedure
1. Have students work in groups of two, and use a pencil and blank graph paper to plot the data points represented in Tables 1 - 3. You can print off the blank graph page for students if you do not want them to set up the scales by themselves.
2. Afterwards, students should share their graph with the class. Once the first graph is done, have students continue plotting the second and third set of data points.
3. Students will then compare the three plots to see the change over time. Instruct students to name which physical features of the island are seen on the graph as they would be moving from bay to ocean.

Discussion
What is a topographical profile?
Why do park rangers and other scientists conduct them?
What is your favorite beach and why? What are the key elements to an enjoyable day at the beach? How would sea-level rise, at your favorite beach, change what kind of activities you can enjoy?

Students will share their graphs of a topographic profile and discussion questions with the class in a short presentation.

National Park Service
www.nps.gov

Integration & Application Network (IAN)
University of Maryland Center for Environmental Science
www.ian.umces.edu

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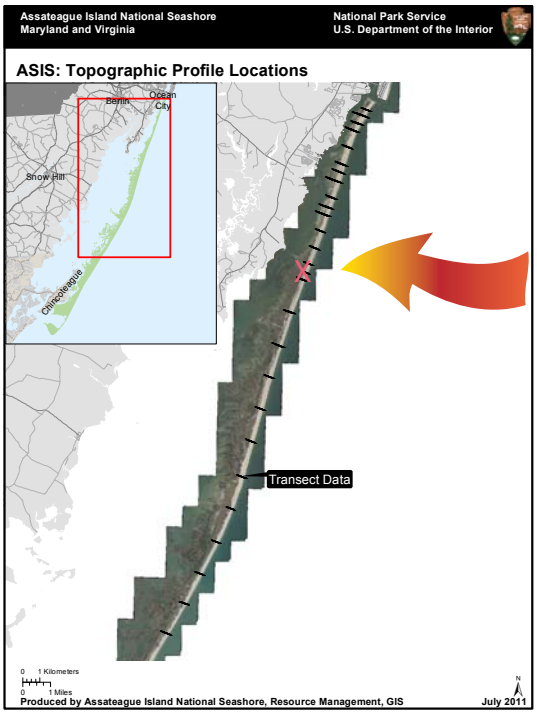
Student Worksheet

All good scientists know how to graph, but it takes some practice. Not all graphs need to start at zero! The lowest and highest distance values will be your range for setting up the graph. So your x-axis will range from 140 to 440, and your y-axis from 0 to 7. Setting up the graph is the hard part of the assignment so use a pencil. Make sure you label your graph.

Each data point is like a point on a graph, it has a distance and an elevation. This set of data was collected in the Fall of 1996. (150, 0.92) is the first data point and represents a 150 meter distance from the bay as the transect is walked towards the Atlantic Ocean, and 0.92 meters high in elevation, from a set starting point. The red arrow points to the transect on Assateague where the data was collected.



The Transect Topographical Profile data came from here

The black lines on this map are transects across the island from bayside to oceanside.

Make three separate graphs. Plot the 1996 data set first and see how the elevation changes across the island. Use a green color pencil.

Table 1: 1996 (Sept) Data Points

	Distance in meters	Elevation in meters		Distance in meters	Elevation in meters
1	150	.92	20	298	1.3
2	158	.88	21	306	1.8
3	167	.86	22	314	1.8
4	176	1.7	23	323	2.4
5	185	1.2	24	332	3.3
6	192	1.4	25	340	4.9
7	201	1.1	26	345	3.8
8	209	1.5	27	353	3.2
9	217	1.0	28	360	2.8
10	224	1.0	29	367	6.1
11	232	1.1	30	374	2.5
12	239	.89	31	382	2.4
13	247	.89	32	391	2.3
14	254	1.2	33	399	2.1
15	263	1.9	34	408	1.7
16	272	1.3	35	417	1.6
17	275	2.9	36	424	1.6
18	281	1.2	37	432	.84
19	290	1.3	32	439	.17

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Student Worksheet

Plot the 2004 data in blue and the 2010 data in red.

Discussion

Would you expect the elevation of Assateague Island to remain exactly the same from 1996 to 2004? If there are changes on the island, where do you think they would or would not occur?

Compare the elevation profiles for the different years - Does the island seem to change its topography over the years?

What natural processes cause the island to change its elevation?

Table 2: 2004 (Oct) Data Points

	Distance in meters	Elevation in meters		Distance in meters	Elevation in meters
1	152	.90	33	322	2.1
2	162	.89	34	332	2.9
3	172	1.0	35	342	3.9
4	173	1.3	36	352	3.3
5	176	1.7	37	360	2.6
6	178	1.5	38	361	2.8
7	182	1.1	39	361	3.7
8	186	1.3	40	362	4.0
9	188	1.3	41	362	4.2
10	190	1.7	42	362	4.5
11	192	1.4	43	362	4.7
12	195	1.5	44	362	4.8
13	197	1.2	45	363	4.7
14	202	1.1	46	363	4.4
15	207	1.4	47	364	4.7
16	212	1.3	48	365	5.5
17	222	.95	49	366	5.8
18	232	1.4	50	366	5.9
19	242	1.3	51	367	5.7
20	252	1.3	52	367	4.6
21	255	1.5	53	368	4.3
22	257	1.8	54	369	3.7
23	257	1.9	55	370	3.2
24	257	2.0	56	371	2.8
25	259	1.7	57	372	2.7
26	262	1.9	58	382	2.6
27	272	1.9	59	390	2.6
28	279	1.9	60	392	2.4
29	282	1.6	61	397	1.8
30	292	1.4	62	399	1.4
31	302	1.7	63	402	.95
32	312	2.0	64	404	.66

Table 3: 2010 (Oct) Data Points

	Distance in meters	Elevation in meters		Distance in meters	Elevation in meters
1	192	1.4	26	372	2.4
2	197	1.3	27	382	2.3
3	202	1.5	28	392	2.3
4	208	2.0	29	402	2.4
5	212	1.8	30	402	2.4
6	222	1.5	31	412	1.8
7	232	1.8	32	422	1.2
8	242	1.6	33	422	1.3
9	252	1.7	34	432	.30
10	257	2.5	35	432	.31
11	259	2.2	36	433	.16
12	267	2.4	37	434	.16
13	272	2.2			
14	282	2.0			
15	292	1.6			
16	302	1.6			
17	312	1.8			
18	320	2.0			
19	322	2.3			
20	332	2.5			
21	342	2.1			
22	352	2.2			
23	360	2.6			
24	362	3.1			
25	365	3.0			

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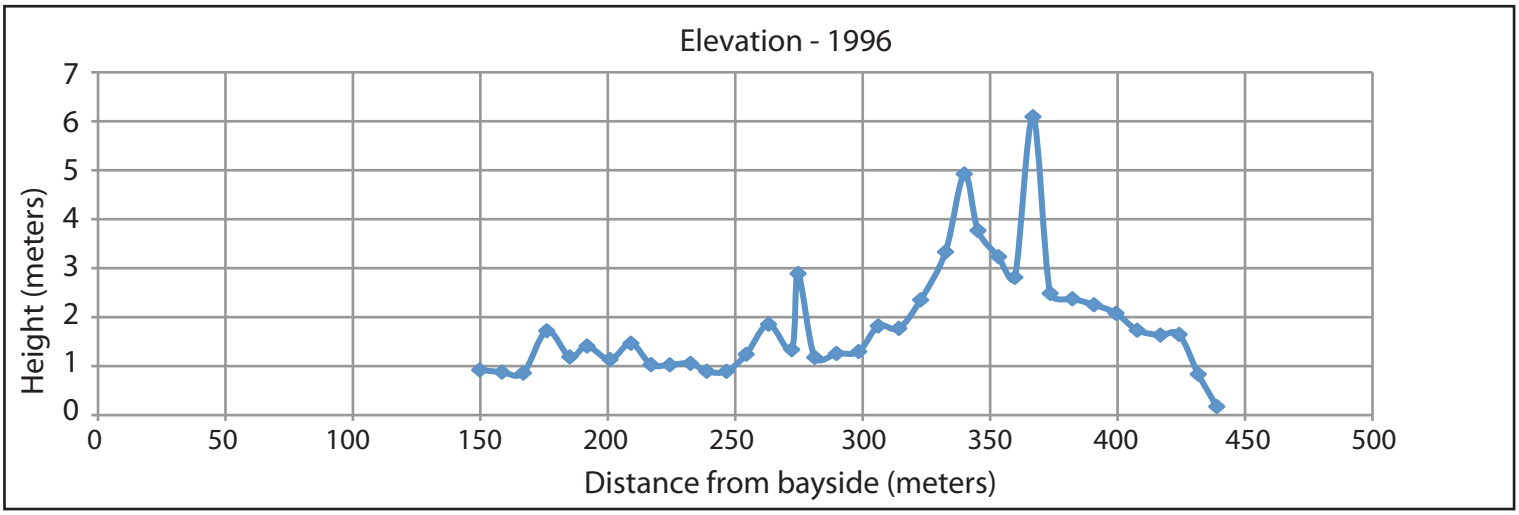
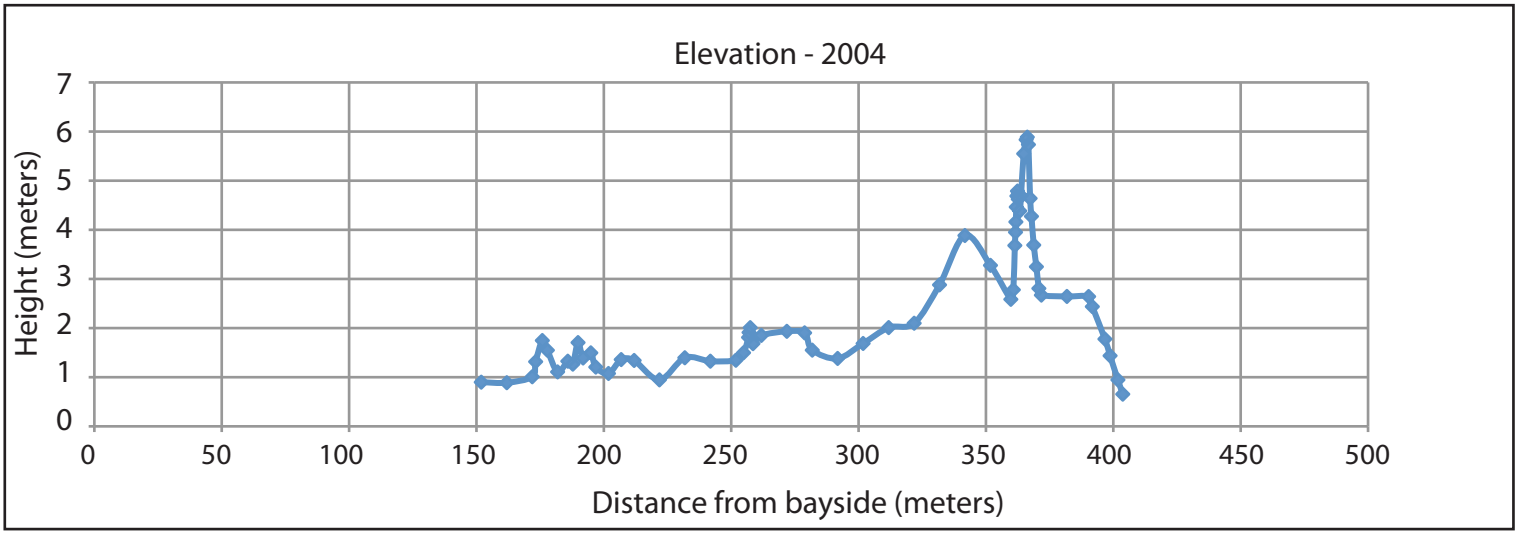
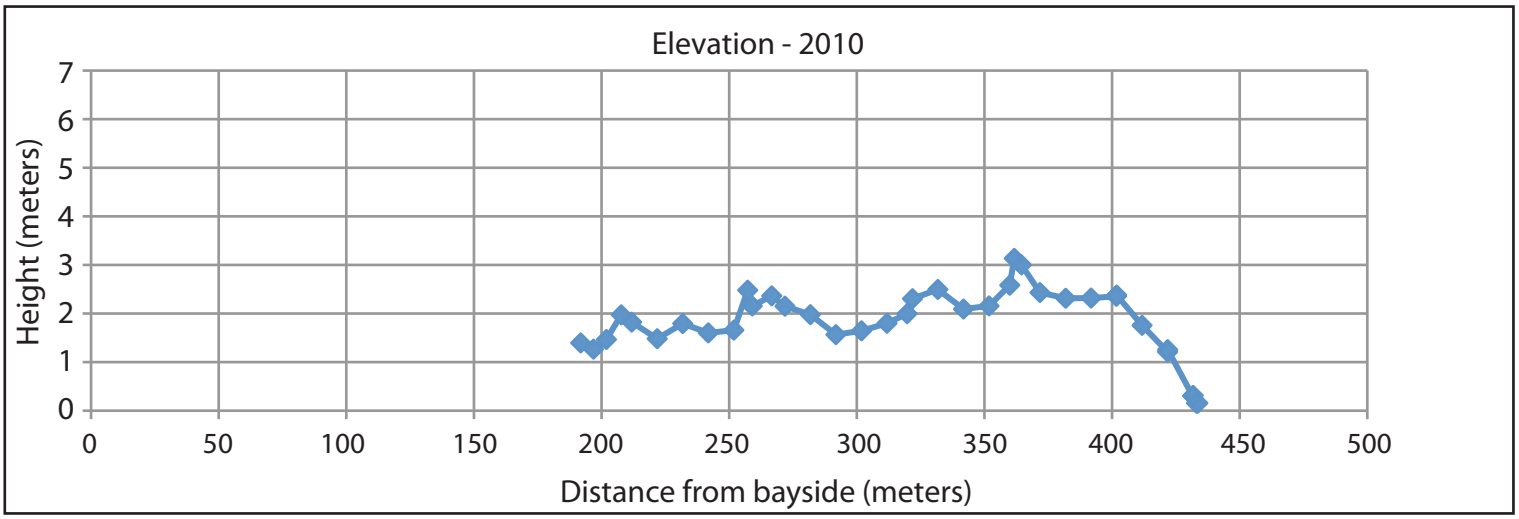
Teacher Notes and Completed Graphs

Use this page to see if students completed the data plot graph correctly. You can also provide students with the blank graph pages that already have units listed in the correct scale.







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Student Worksheet

Name:_____ Period:_____