

Boat Registration and Manatee Deaths in Florida

by – Susan Lee

Activity overview

Students will explore the data on boat registrations and manatee deaths in Florida. They will use the data, the graph of the data and the line of best fit to make predictions about the relationship of the data.

Concepts

Scatter plots, line of best fit, correlation, extrapolation, estimation, functions, predictions

Teacher preparation

- Download the calculator program – *Statistics_Manatee_Lee.tns*
- Print enough worksheets for each student

Classroom management tips

- The activity will run smoothly if the students have had some practice using the Nspire to graph

TI-Nspire Applications

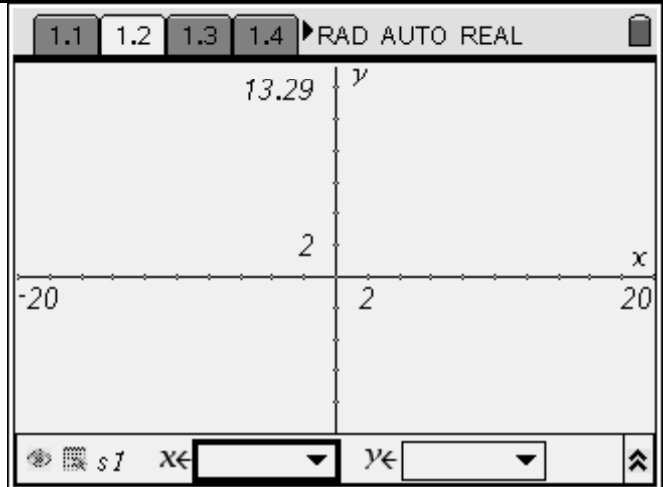
Lists and spreadsheets, Data and statistics, graphs and geometry

Step-by-step directions

1. Scroll through the data and predict what you think the relationship is between the number of registered boats (column C) and the number of manatee deaths by boats (column D)

	A year	B de..	C boats	D bo..	E	F
1	1977	114	447000	13		
2	1978	84	460000	21		
3	1979	77	481000	24		
4	1980	63	498000	16		
5	1981	116	513000	24		
A1	1977					

2. Make a scatter plot to observe the relationship visually. Don't forget to change the graph to a scatter plot and zoom data.

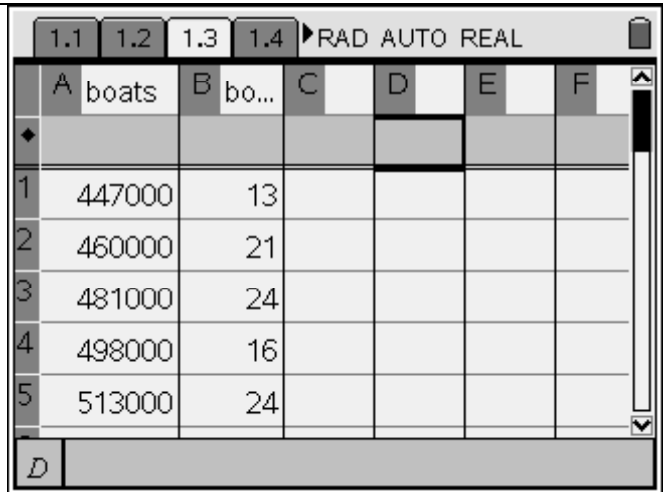


3. Is there a correlation between the number of registered boats and the manatee deaths? Predict the correlation.

4. Go to screen 1.3. Calculate the correlation and line of best fit using statistics (push menu). What is the correlation? _____

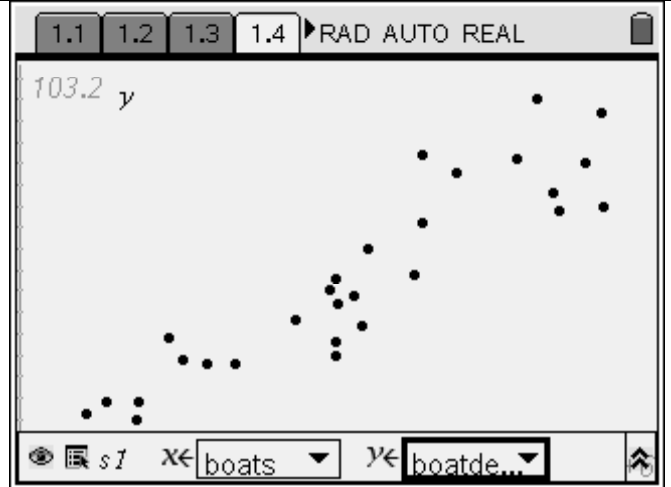
What is the line of best fit?

Based on the correlation and the data would you feel comfortable using the line of best fit to make predicts for the future? Why or why not?



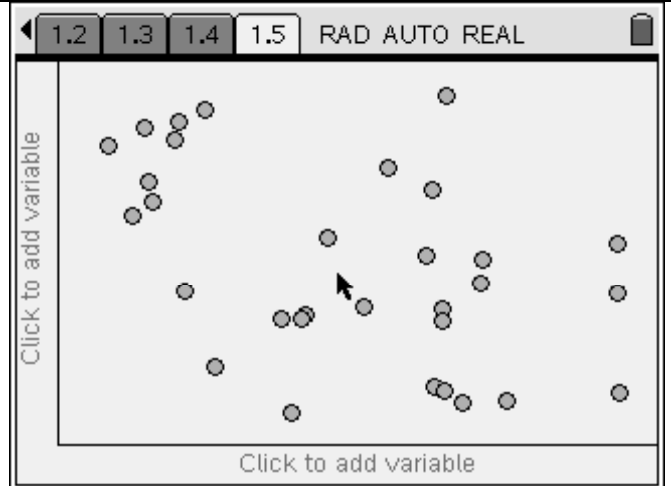
	A boats	B bo...	C	D	E	F
1	447000	13				
2	460000	21				
3	481000	24				
4	498000	16				
5	513000	24				

5. Revisit the graph of the data. Change the graph to a function graph and graph the line of best fit.



6. Based on your calculations predict the number of manatee deaths for 2008

7. Explore the data and statistics screen. Place your cursor on the click to add variable at the bottom of the graph and change the variable to boats. Place your cursor on the click to add variable at the side of the graph and change it to boat deaths. Push the menu key and go to action. Go to regression and choose show linear ($a+bx$). Compare the graph with screen 1.4. They should be the same. This is just another feature to explore.



8. Brainstorm some ways to help the manatee. Boating is a favorite past time in Florida so getting rid of the boats isn't an option. What else can Florida do to save the manatee?

Assessment and evaluation

- Students will complete a worksheet that can be graded for completion or graded for correct answers.

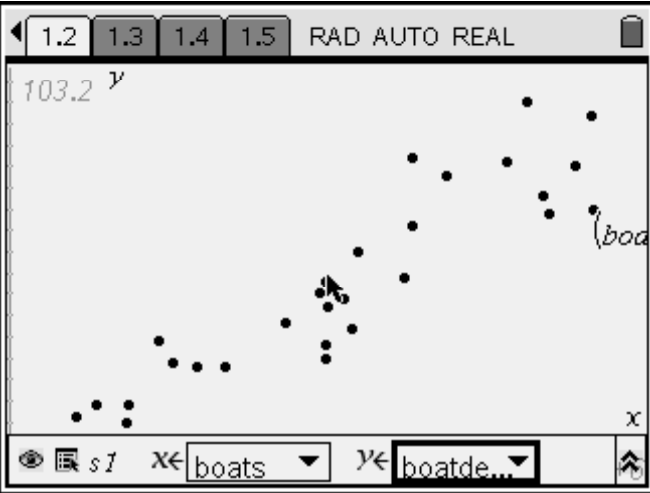
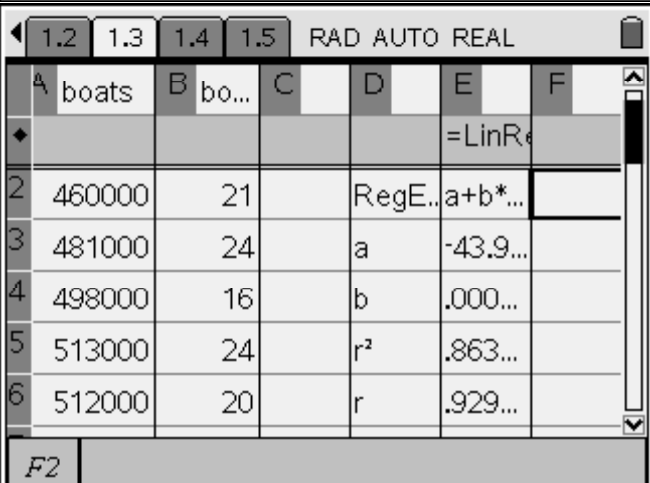
Activity extensions

- Have the students research some topic of choice and practice graphing the data

Student TI-Nspire Document

Boat registration and Manatee deaths in Florida Worksheet
Statistics_Manatee_Lee.tns

Selected answers

																																																		
<p>Correlation - .9294 Strong positive correlation</p> <p>Line of best fit $Y = -43.9512 + 0.0001306x$</p>	 <table border="1"> <thead> <tr> <th></th> <th>A boats</th> <th>B bo...</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>=LinRe</td> <td></td> </tr> <tr> <td>2</td> <td>460000</td> <td>21</td> <td></td> <td>RegE..</td> <td>a+b*...</td> <td></td> </tr> <tr> <td>3</td> <td>481000</td> <td>24</td> <td></td> <td>a</td> <td>-43.9...</td> <td></td> </tr> <tr> <td>4</td> <td>498000</td> <td>16</td> <td></td> <td>b</td> <td>.000...</td> <td></td> </tr> <tr> <td>5</td> <td>513000</td> <td>24</td> <td></td> <td>r²</td> <td>.863...</td> <td></td> </tr> <tr> <td>6</td> <td>512000</td> <td>20</td> <td></td> <td>r</td> <td>.929...</td> <td></td> </tr> </tbody> </table>		A boats	B bo...	C	D	E	F	1					=LinRe		2	460000	21		RegE..	a+b*...		3	481000	24		a	-43.9...		4	498000	16		b	.000...		5	513000	24		r ²	.863...		6	512000	20		r	.929...	
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