DATA ANALYSIS SUMMARY

Annual Time Online (Hours) in Calvert Cliffs

BY Bessie Turcios

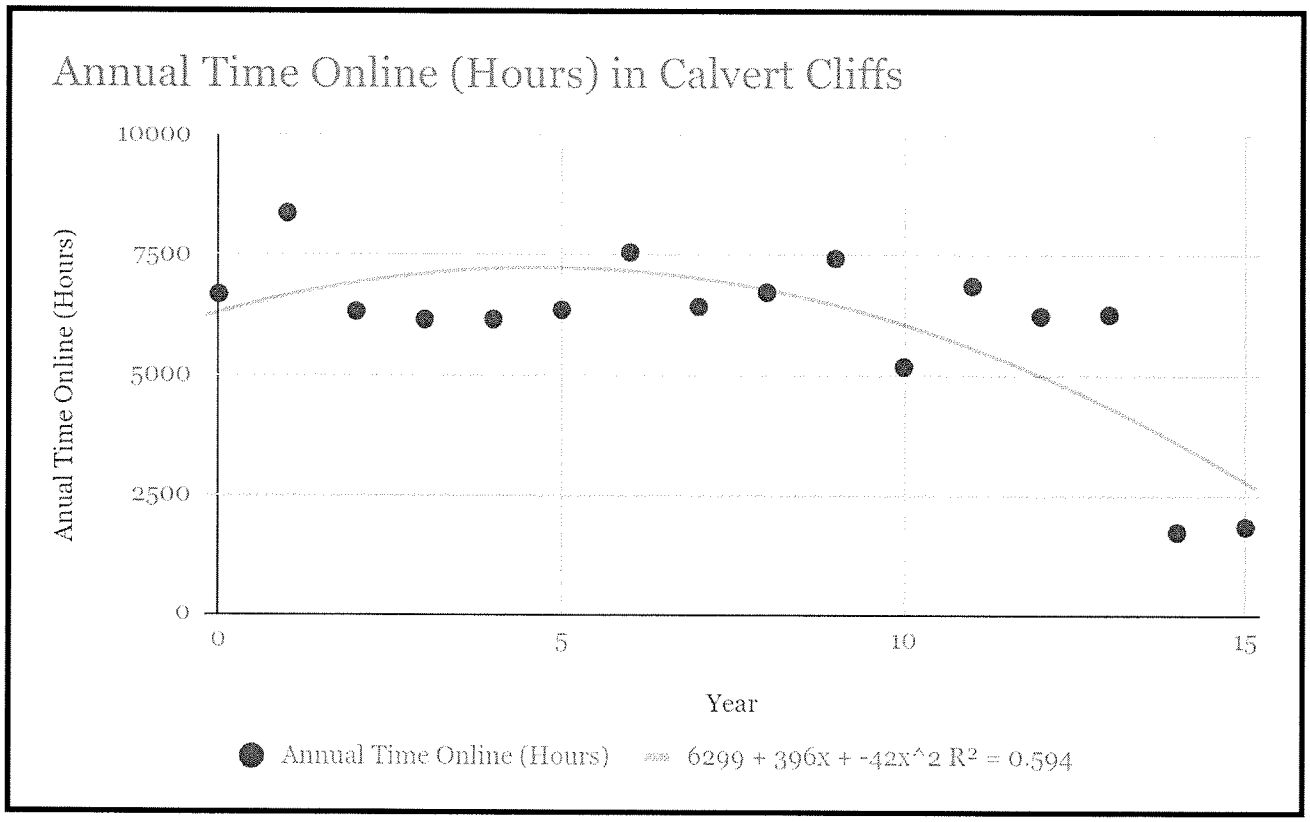


Figure 1: Annual time online in hours in Calvert Cliffs from 1975-1990. This scatter plot slowly decreases overtime, then drastically dropped in 1989. In 1990, the annual time online was 1840 hours. Based on the regression equation in 2019, the value of the annual time in Calvert Cliffs would be -57659. However, this prediction would not be accurate because the R^2 has a very weak correlation. Mainly because the closer the r-squared value is to 1, the more reliable it would be to use. Since the r-square value is 0.594, this means the correlation is very weak because it is not close to 1. Although the annual time dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual time and it has a weak correlation.

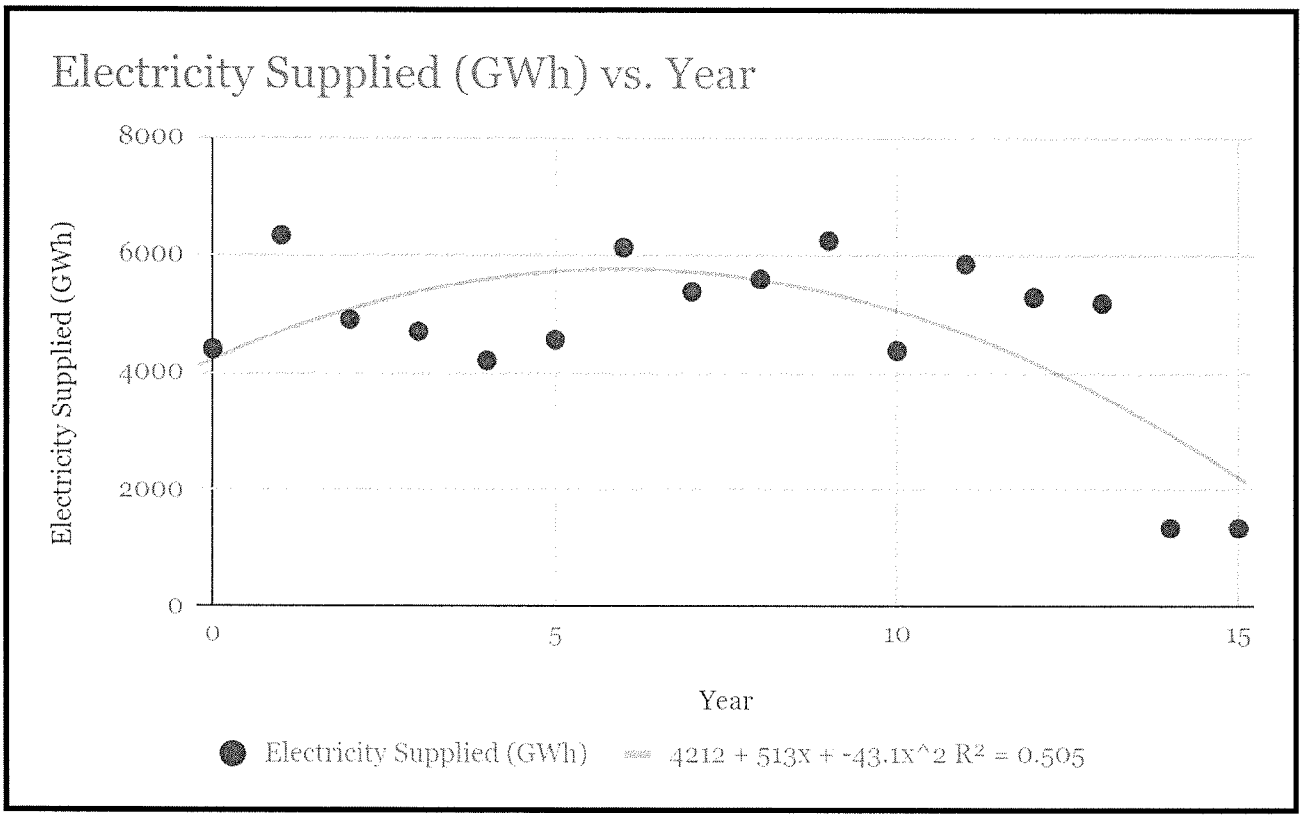


Figure 2: Energy available annually in Calvert Cliffs from 1975-1990. This scatter plot slowly decreases overtime, then drastically drops in 1989. In 1989, the energy availability was 1345.62 GWH. Based on the regression equation in 2019, the value of energy available in Calvert Cliffs would be -56657.6. However, this prediction would not be accurate because the R^2 has a very weak correlation. Mainly because the closer the r-squared value is to 1, the more reliable it would be. Since the r-square value is 0.505, this means the correlation is very weak because it is not close to 1. Although the annual energy available dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual energy and it is weak correlation.

Name: Bessie Turcios Class Period: D

Data Analysis Project Checklist:

My Topic: NUCLEAR POWER

When you have completed a step, right click on the check box and select the check mark.

- ❑ Part 1: Gathering Data
  - ✓ Data sources found and **Part 1 - Gathering Data** complete on Google Doc
  - ✓ Data entered in spreadsheet
- ❑ Part 2: Scatter Plots and Observations
  - ✓ Scatter Plots created in spreadsheet
  - ✓ Observations section **Part 2 - Scatter Plots and Observations** in Google Doc complete
  - ✓ Peer review of scatter plots complete
- ❑ Part 3: Regression Equations, Analysis and Conclusions
  - ✓ Regression equations found and copied into Google Doc
  - ✓ Analysis and Conclusions complete for each scatter plot
- ❑ Part 4: Captions
  - ☑ First draft of captions
  - ☑ Peer review of captions
  - ☑ Captions revised and finalized
- ☑ Final Product created and turned in

Part 1 - Gathering Data:

Data Set #1:

Years available in data set: 1975-2017
Years to be used in scatter plot (minimum 5): 1975-1990
Y-variable with units: Annual Time Online (Hours)

Source: *http://www.world-nuclear.org/reactor/default.aspx/CALVERT%20CLIFFS-1*

Save a copy of your data as a PDF in your Algebra 2 folder by printing to PDF.*

What is this data about? Write 1-2 sentences describing what the information is about in this data set. *For example: This data set is showing the national participation of students in the free breakfast program from the years 2000-2010.*

This data set is showing the annual time online in hours of Calvert Cliffs from the years 1975-1990.

Data Set #2:

Years available in data set: 1975-2017
Years to be used in scatter plot (minimum 5): 1975-1990
Y-variable with units: Electricity Supplied (GWh)

Source: *http://www.world-nuclear.org/reactor/default.aspx/CALVERT%20CLIFFS-1*

Save a copy of your data as a PDF in your Algebra 2 folder by printing to PDF.*

What is this data about? Write 1-2 sentences describing what the information is about in this data set. *For example: This data set is showing the national participation of students in the free breakfast program from the years 2000-2010.*

This data set is showing the Electricity Supplied in GWh of Calvert Cliffs from the years 1975-1990.

IF YOU ARE COMPLETING MORE THAN 2 SCATTER PLOTS, COPY AND PASTE EACH ORGANIZER ABOVE AND CHANGE THE NUMBER (#).

Part 2 - Scatter Plots and Observations

We went through creating scatter plots together in class, but if you need a step-by-step guide, you can find a PDF to help here.

Observations Scatter Plot #1: Annual Time Online (Hours) vs. Years

1. Scatter Plot Title: *Annual Time Online (Hours) vs. Years*
2. **X-Axis Variable**: Years
   Y-Axis Variable: Annual Time Online (Hours)
3. Write down AT LEAST TWO "**trends**" you see on the scatter plot. **WRITE IN COMPLETE SENTENCES.**

   The scatter plot slowly increases but drops in certain years. In the year 1989, it drastically drops.

4. Write down AT LEAST TWO "**wonderings**" you have about the scatter plot. **WRITE IN COMPLETE SENTENCES.**

   I wonder why did the scatter plot drop drastically in the year 1989-1990? Also why is it always in the range of the 6000s?

Peer Feedback Scatter Plot #1:

Peer Reviewer Name: Yenny

HIGHLIGHT your score for each check-box below and give an overall score.
Make sure to give your peer **specific, kind and actionable** feedback in the comments section, especially if they have not achieved a 4.0 yet.

Learning Target	4.0	3.0	2.0	1.0
8.10: I can create polished scatter plots to convey information.	Contains ALL of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 3 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 2 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 0 or 1 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph

Peer Reviewer Overall Score: 4/4.0

Comments for peer:

Change the title. I like the red color makes it seem more professional and it's easier to see what your showing.

Observations Scatter Plot #2: Electricity Supplied (GWh) vs. Year

5. Scatter Plot Title: *Electricity Supplied (GWh) vs. Year*
6. **X-Axis Variable:** Year
   Y-Axis Variable: Electricity Supplied (GWh)
7. Write down AT LEAST TWO "**trends**" you see on the scatter plot. **WRITE IN COMPLETE SENTENCES.**

   The scatter plot increases and decreases. In the year 1989, it drastically drops.

8. Write down AT LEAST TWO "**wonderings**" you have about the scatter plot. **WRITE IN COMPLETE SENTENCES.**

   I wonder why did the scatter plot drop drastically in the year 1989-1990? Also why does the number have a decimal point?

Peer Feedback Scatter Plot #2:

Peer Reviewer Name: Yenny

HIGHLIGHT your score for each check-box below and give an overall score.
Make sure to give your peer **specific, kind and actionable** feedback in the comments section, especially if they have not achieved a 4.0 yet.

Learning Target	4.0	3.0	2.0	1.0
8.10: I can create polished scatter plots to convey information.	Contains ALL of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 3 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 2 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph	Contains 0 or 1 of: ❑ Title is clear and concise ❑ X-Axis is correctly labeled with units ❑ Y-Axis is correctly labeled with units ❑ Legend appears on graph

Peer Reviewer Overall Score: 4/4.0

Comments for peer:

The title should be change but it's good.

IF YOU ARE COMPLETING MORE THAN 2 SCATTER PLOTS, COPY AND PASTE EACH ORGANIZER ABOVE AND CHANGE THE NUMBER (#) BEFORE PEER REVIEW.

Part 3 - Regression Equations, Analysis and Conclusions

Regression Equations Scatter Plot #1:

- Make 3 copies of your scatter plot on the SAME spreadsheet.
- Add a trendline of each type on the scatter plots and complete the table below. If you need help adding a trendline, follow the directions here.

Trendline Type	Equation	R^2 Value	Describe correlation
Linear	*Copy and paste **linear** equation here* ***-234*x+7770***	**0.385**	weak correlation
Quadratic (Polynomial)	*Copy and paste **quadratic** equation here* ***6299+396x+-42x^2***	**0.594**	weak correlation
Exponential	*Copy and paste **exponential** equation here* ***7659e^-0.0283x***	**0.319**	weak correlation

Analysis and Conclusions Scatter Plot #1:

Correlation: What type of correlation does your scatter plot appear to have (strong/weak, positive/negative, no correlation)? What does this correlation indicate about your topic? *For example: The strong positive correlation shown in the graph indicates that obesity was rising from 2002-2012.*

My scatter plot appears to have weak correlation which indicates that there hasn't been an increase or decrease of annual time online in 1975-1990.

Regression Equation: Based on the regression equations above, which of the regressions is the **best fit** for your data and how do you know? (use the R^2 value to justify your answer)

Based on the regression equation above, quadratic is the best fit for my data because it is the highest R^2 value and closer to 1. Quadratic regression R^2 0.594.

Comparing to current data:
According to the regression equation, what is the value of your data in 2009? How does this number compare to the ACTUAL data set value in the same year?
If you do NOT have data for 2009, select a year that you do have data for.

The value of my data in 1980 would be 7229 and my actual data for 1980 is 6349. There is a 880 difference between my regression equation and actual data set value. This means that its not close to being accurate because there's a big difference between my regression equal and data set value.

Predictions:

According to the regression equation, what is the value of your data in 2019? Is this prediction realistic? Why or why not?

According to the regression equation, the value would be -57659 in 2019. This prediction is realistic because since 1975-1990, the annual time online has been slowly decreasing. By the time it reaches in 2019, the annual time would be low.

According to the regression equation, what is the value of your data in 2025? Is this prediction realistic? Why or why not?

According to the regression equation, the value would be 129679 in 2025. This prediction is unrealistic because since 1975-1990, the annual time online has slowly been decreasing rather than increasing.

Analysis: What do your predictions mean for the future of your data? Based on the correlation coefficient, are your predictions reliable?

My predictions are not realistic because it is not possible to have negative annual time online. Also the regression equation wouldn't be as accurate to use because it is a weak correlation.

Regression Equations Scatter Plot #2:

- Make 3 copies of your scatter plot on the SAME spreadsheet.
- Add a trendline of each type on the scatter plots and complete the table below. If you need help adding a trendline, follow the directions here.

Trendline Type	Equation	R^2 Value	Describe correlation
Linear	*Copy and paste **linear** equation here* ***-133*x+5720***	**0.183**	weak correlation
Quadratic (Polynomial)	*Copy and paste **quadratic** equation here* ***4212+513x+-43.1x^2***	**0.505**	weak correlation
Exponential	*Copy and paste **exponential** equation here* ***555oe^-0.015x***	**0.109**	weak correlation

Analysis and Conclusions Scatter Plot #2:

Correlation: What type of correlation does your scatter plot appear to have (strong/weak, positive/negative, no correlation)? What does this correlation indicate about your topic? *For example: The strong positive correlation shown in the graph indicates that obesity was rising from 2002-2012.*

My scatter plot appears to have weak correlation which indicates that there hasn't been an increase or decrease of electricity supplied in 1975-1990.

Regression Equation: Based on the regression equations above, which of the regressions is the **best fit** for your data and how do you know? (use the R^2 value to justify your answer)

Based on the regression equation above, quadratic is the best fit for my data because it is the highest R^2 value and closer to 1. My quadratic regression R^2 is 0.594.

Comparing to current data:

According to the regression equation, what is the value of your data in 2009? How does this number compare to the ACTUAL data set value in the same year?

If you do NOT have data for 2009, select a year that you do have data for.

The value of my data in 1980 would be 5699.5 and my actual data for 1980 is 4542.5. There is a 1157 difference between my regression equation and actual data set value. This means that is not close to being accurate because there is a 1000 difference between my regression equal and data set value.

Predictions:

According to the regression equation, what is the value of your data in 2019? Is this prediction realistic? Why or why not?

According to the regression equation, the value would be -56657.6 in 2019. This prediction is realistic because since 1975-1990, electricity supplied has been slowly decreasing. By the time it reaches in 2019, the electricity supplied would be low.

According to the regression equation, what is the value of your data in 2025? Is this prediction realistic? Why or why not?

According to the regression equation, the value would be -77888 in 2025. This prediction is unrealistic because since 1975-1990, the electricity supplied has slowly been decreasing rather than increasing.

Analysis: What do your predictions mean for the future of your data? Based on the correlation coefficient, are your predictions reliable?

My predictions are not realistic because it is not possible to have a negative electricity supplied. Also the regression equation wouldn't be as accurate to use because it is a weak correlation.

IF YOU ARE COMPLETING MORE THAN 2 SCATTER PLOTS, COPY AND PASTE EACH ORGANIZER ABOVE AND CHANGE THE NUMBER (#).

Part 4 - Caption Writing

Caption Draft - Scatter Plot #1

Many of these pieces you have already written in the various parts of your project. Write each piece separately before putting them together into a full caption.

Title: Write your draft of the ***title*** portion.

Title includes both the dependent variable and the span of years.

Annual time online in hours in Calvert Cliffs from 1975-1990.

Trends: Write at least two sentences describing the ***trends*** you see in your scatter plot.

Data Analysis Word Bank:

Increasing, decreasing, however, trend/trending, not/moderately/highly correlated, remains constant, until

This scatter plot shows the annual time online in hours slowly decreases in 1975, then drastically drops in 1989.

Comparison Point: Write one sentence that describes the ***last data point you know***.

In 1990, the annual time online was 1840 in hours.

Prediction: Write a sentence with your ***prediction*** based on the regression equation. You can use either of your predicted values from Part 3.

"Based on the regression equation…"

"If trends continue according to the regression equation…"

Based on the regression equation in 2019, the value of the annual time in Calvert Cliffs would be -57659.

Analysis of Prediction Quality: Write at least two sentences evaluating the ***reliability*** of your prediction and justifying your evaluation.

Use a transition word.

Reference the R^2 value and describe what it means.

However, this prediction would not be accurate because the R^2 has a very weak correlation. The closer the r-squared value is to 1, the more reliable it would be to use.

Implications: Write at least two sentences describing the implications of your prediction.

"If….then…."

"This means that…."

The r-square value is 0.594. This means that the correlation is very weak because it is not close to 1. Although the annual time dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual time and it is weak correlation. Based on the regression equation in 2019, the value of the annual time in Calvert Cliffs would be -57659.

Peer Review - Caption #1

Does the caption contain all of the necessary parts? If not, what parts are missing or incomplete?	The overall trend isn't described.
What are some of the **stars** of the caption? What is well done?	The title is very descriptive.
What are some of the **stairs** of the caption? What should your peer work on?	The analysis of the prediction and the implications don't make a lot of sense to me.

Caption Final - Scatter Plot #1

Copy and paste the final, revised parts of your caption into one paragraph below.

Annual time online in hours in Calvert Cliffs from 1975-1990. This scatter plot slowly decreases overtime, then drastically dropped in 1989. In 1990, the annual time online was 1840 hours. Based on the regression equation in 2019, the value of the annual time in Calvert Cliffs would be -57659. However, this prediction would not be accurate because the R^2 has a very weak correlation. Mainly because the closer the r-squared value is to 1, the more reliable it would be to use. Since the r-square value is 0.594, this means the correlation is very weak because it is not close to 1. Although the annual time dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual time and it has a weak correlation.

Caption Draft - Scatter Plot #2

Many of these pieces you have already written in the various parts of your project. Write each piece separately before putting them together into a full caption.

Title: Write your draft of the ***title*** portion.

Title includes both the dependent variable and the span of years.

Energy available annually in Calvert Cliffs from 1975-1990.

Trends: Write at least two sentences describing the ***trends*** you see in your scatter plot.

Data Analysis Word Bank:

Increasing, decreasing, however, trend/trending, not/moderately/highly correlated, remains constant, until

This scatter plot slowly decreases overtime, then drastically drops in 1989.

Comparison Point: Write one sentence that describes the ***last data point you know***.

In 1989, the energy availability was 1345.62 in GWh.

Prediction: Write a sentence with your ***prediction*** based on the regression equation. You can use either of your predicted values from Part 3.

"Based on the regression equation…"

"If trends continue according to the regression equation…"

Based on the regression equation in 2019, the energy availability was 1345.62.

Analysis of Prediction Quality: Write at least two sentences evaluating the ***reliability*** of your prediction and justifying your evaluation.

Use a transition word.

Reference the R^2 value and describe what it means.

However, this prediction would not be accurate because the R^2 has a very weak correlation. Mainly because the closer the r-squared value is to 1, the more reliable it would be to use.

Implications: Write at least two sentences describing the implications of your prediction.

"If….then…."

"This means that…."

The r-square value is 0.505. This means that the correlation is very weak because it is not close to 1. Although the annual time dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual time and it is weak correlation.

Peer Review - Caption #2

Does the caption contain all of the necessary parts? If not, what parts are missing or incomplete?	Yes
What are some of the **stars** of the caption? What is well done?	You have good information, thorough.

What are some of the **stairs** of the caption? What should your peer work on?	Fix some small grammar issues.

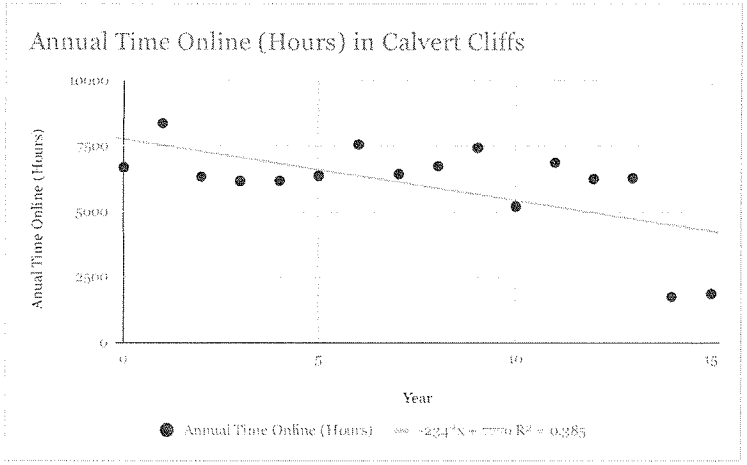
Caption Final - Scatter Plot #2

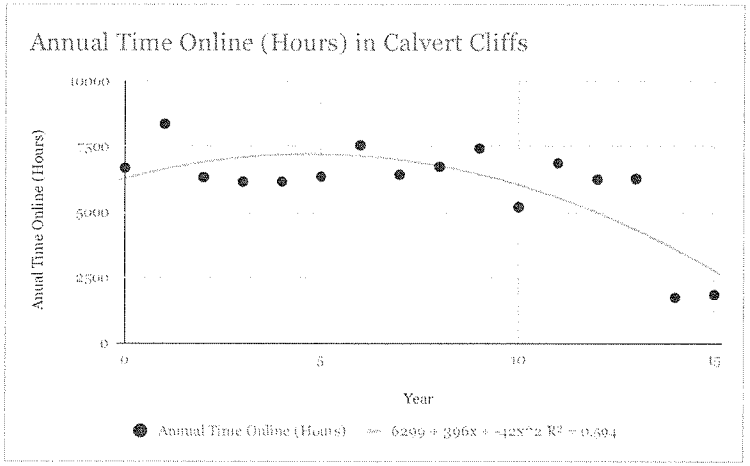
Copy and paste the final, revised parts of your caption into one paragraph below.

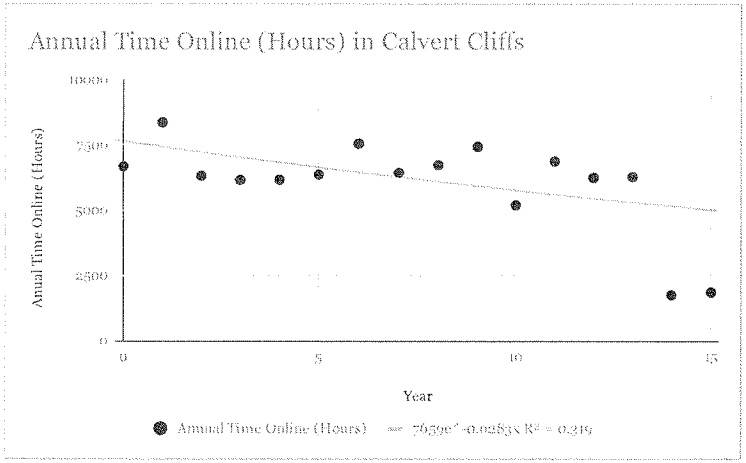
Energy available annually in Calvert Cliffs from 1975-1990. This scatter plot slowly decreases overtime, then drastically drops in 1989. In 1989, the energy availability was 1345.62 GWH. Based on the regression equation in 2019, the value of energy available in Calvert Cliffs would be -56657.6. However, this prediction would not be accurate because the R^2 has a very weak correlation. Mainly because the closer the r-squared value is to 1, the more reliable it would be. Since the r-square value is 0.505, this means the correlation is very weak because it is not close to 1. Although the annual energy available dropped in 1989, the prediction for 2019 wouldn't be reliable because it is not possible to have a negative annual time and it is weak correlation.

IF YOU ARE COMPLETING MORE THAN 2 SCATTER PLOTS, COPY AND PASTE EACH ORGANIZER ABOVE AND CHANGE THE NUMBER (#) BEFORE PEER REVIEW.

Year	Years since _____	Annual Tim <- *Rename these!* Source:	*http://www.world-nuclear.org/reactor/default.aspx/CALVERT%20CLIFFS-1*
1975	0	6667	
1976	1	8356	
1977	2	6313	
1978	3	6150	
1979	4	6154	
1980	5	6349	
1981	6	7544	
1982	7	6419	
1983	8	6719	
1984	9	7422	
1985	10	5186	
1986	11	6855	
1987	12	6233	
1988	13	6263	
1989	14	1727	
1990	15	1840	







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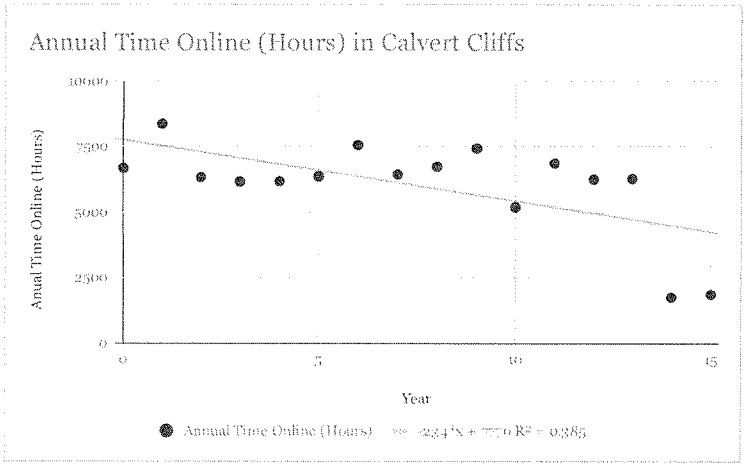
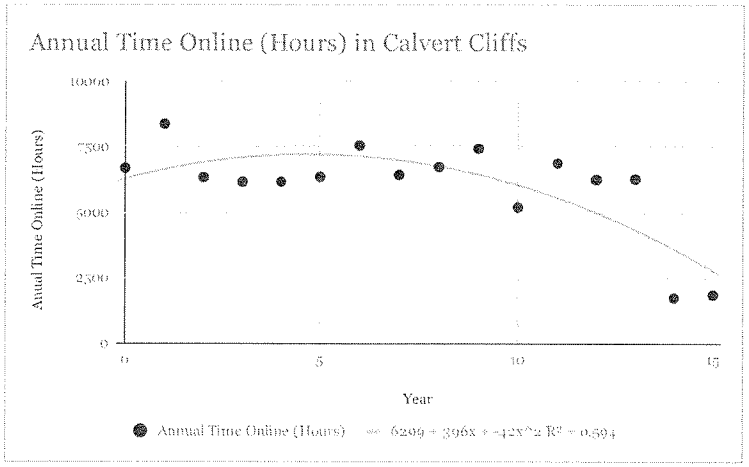
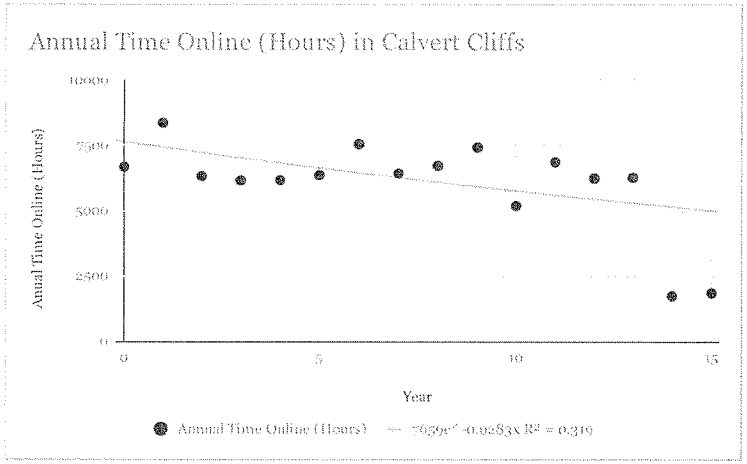
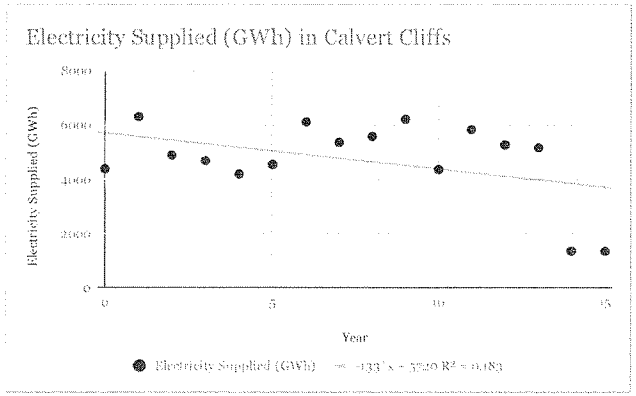
1981	6	7544		
1982	7	6419		
1983	8	6719		
1984	9	7422		
1985	10	5186		
1986	11	6855		
1987	12	6233		
1988	13	6263		
1989	14	1727		
1990	15	1840		

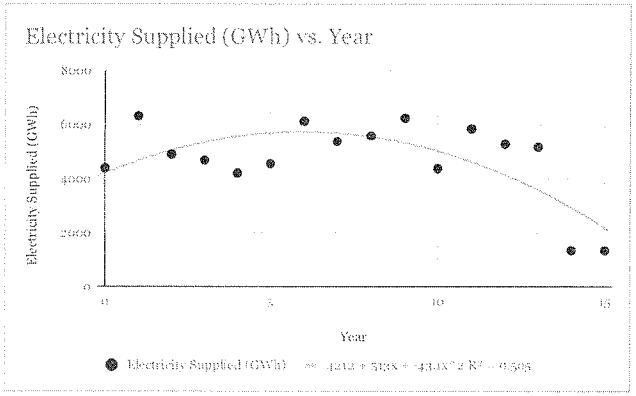


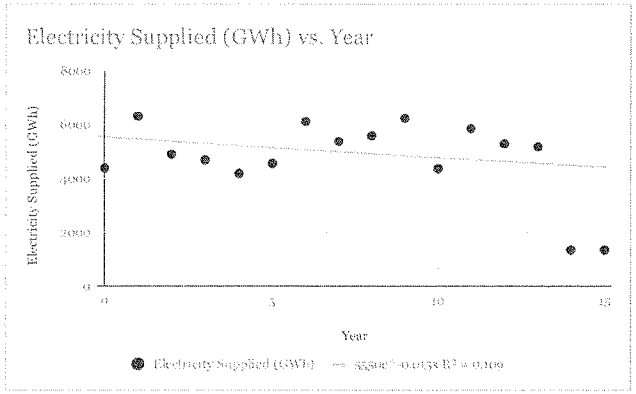




Year	Years since _____	Electricity Supplied (GWl	<- *Rename the* Source:	http://www.world-nuclear.org/reactor/default.aspx/CALVERT%20CLIFFS-1
1975	0	4381.6		
1976	1	6303.9		
1977	2	4882		
1978	3	4676.1		
1979	4	4194.1		
1980	5	4542.5		
1981	6	6109.6		
1982	7	5362.1		
1983	8	5570.7		
1984	9	6221.6		
1985	10	4359.73		
1986	11	5830.74		
1987	12	5268.48		
1988	13	5164.23		
1989	14	1345.62		
1990	15	1344.37		







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1986	11	5830.74			
1987	12	5268.48			
1988	13	5164.23			
1989	14	1345.62			
1990	15	1344.37