

# Carbon, Climate & Energy Resources



## Unit 5

*The Record of Modern CO<sub>2</sub> Accumulation*

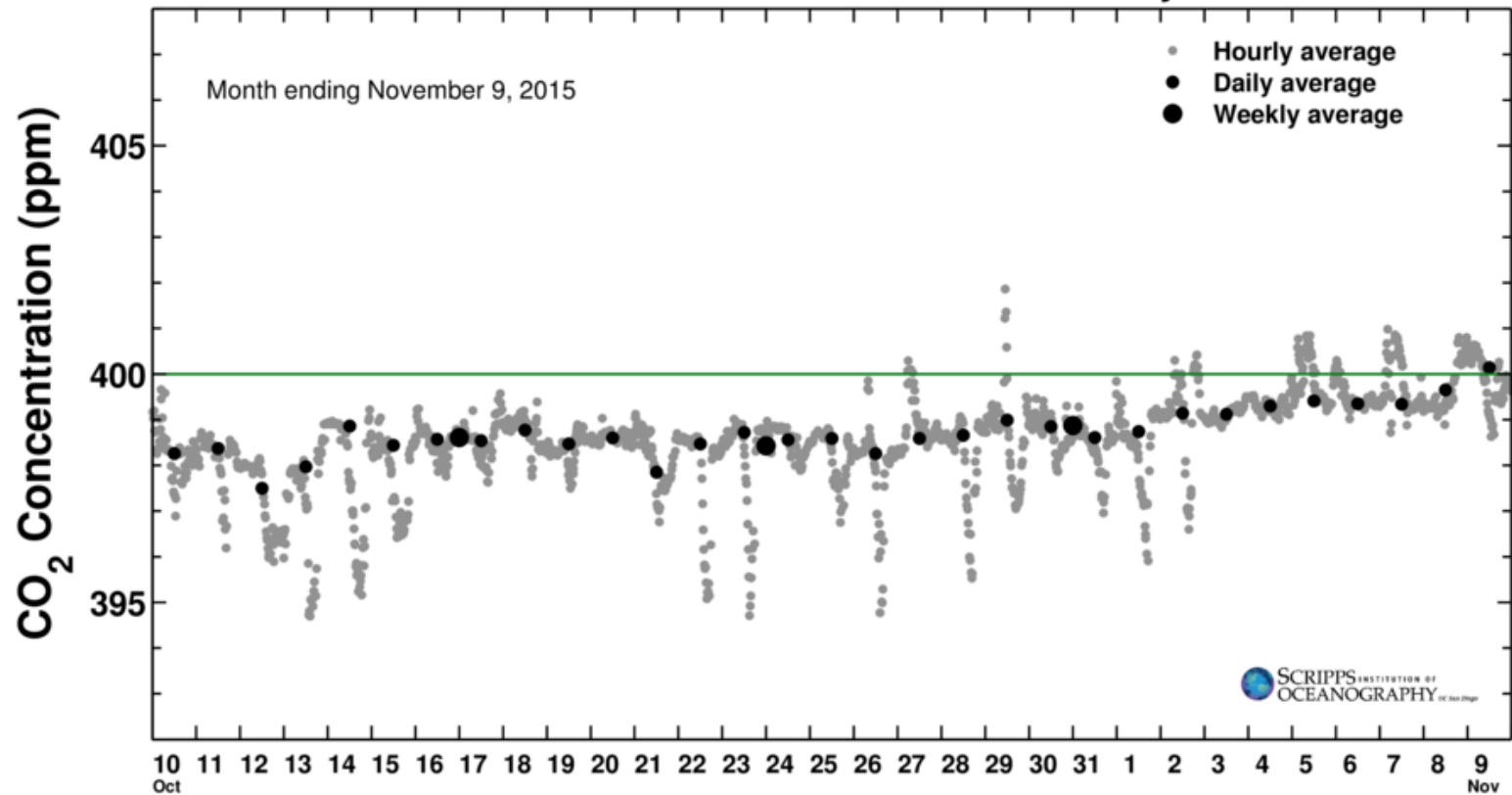
*Gallery Walk and Questions*

# Diagram 1. Changes in CO<sub>2</sub> over 1 month.

Latest CO<sub>2</sub> reading  
November 09, 2015

400.14 ppm

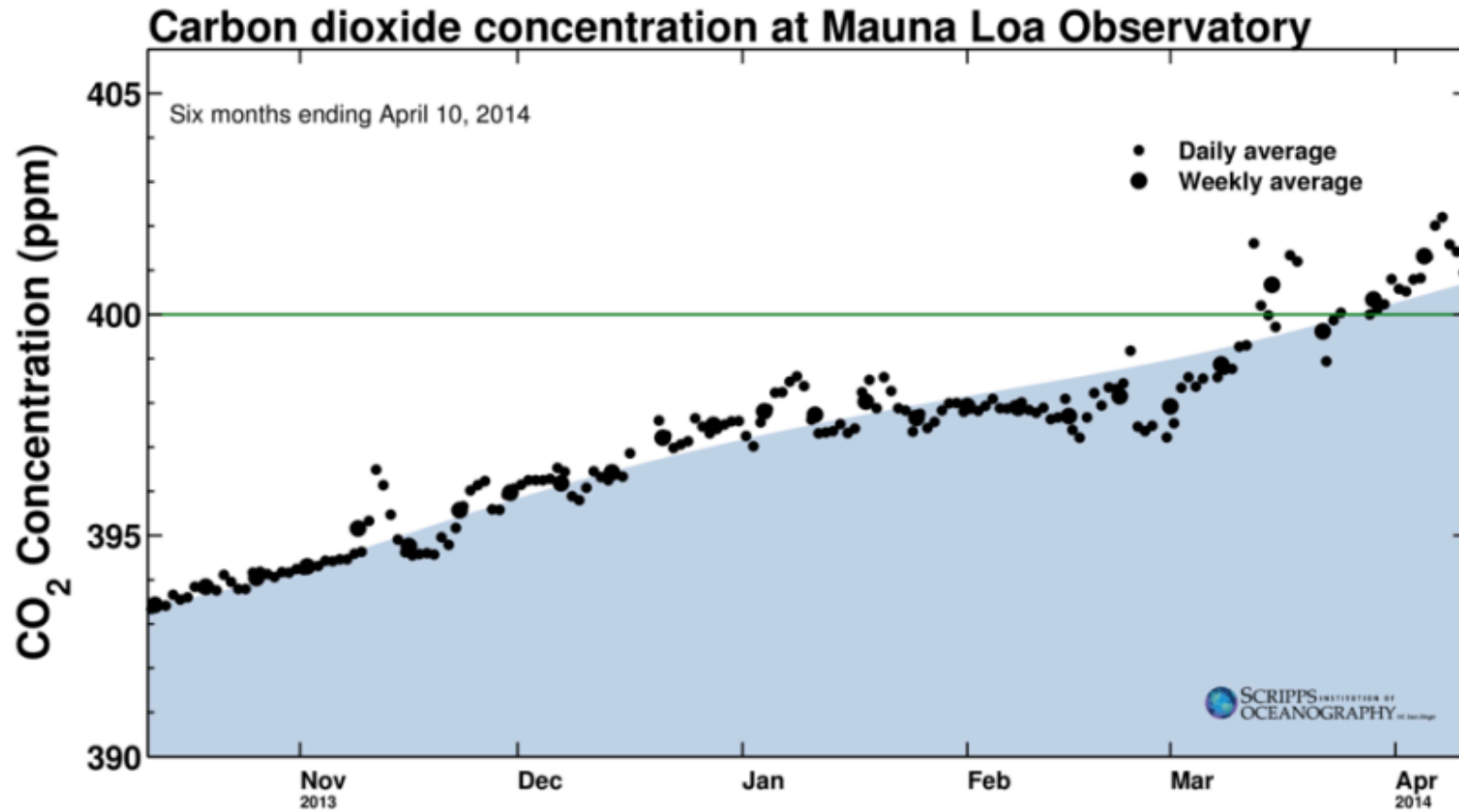
Carbon dioxide concentration at Mauna Loa Observatory



## **Questions for Diagram 1, Changes in CO<sub>2</sub> over 1 month:**

1. Describe the changes in CO<sub>2</sub>.
2. When is average CO<sub>2</sub> highest?
3. When is average CO<sub>2</sub> lowest?
4. What do you think is causing this pattern?

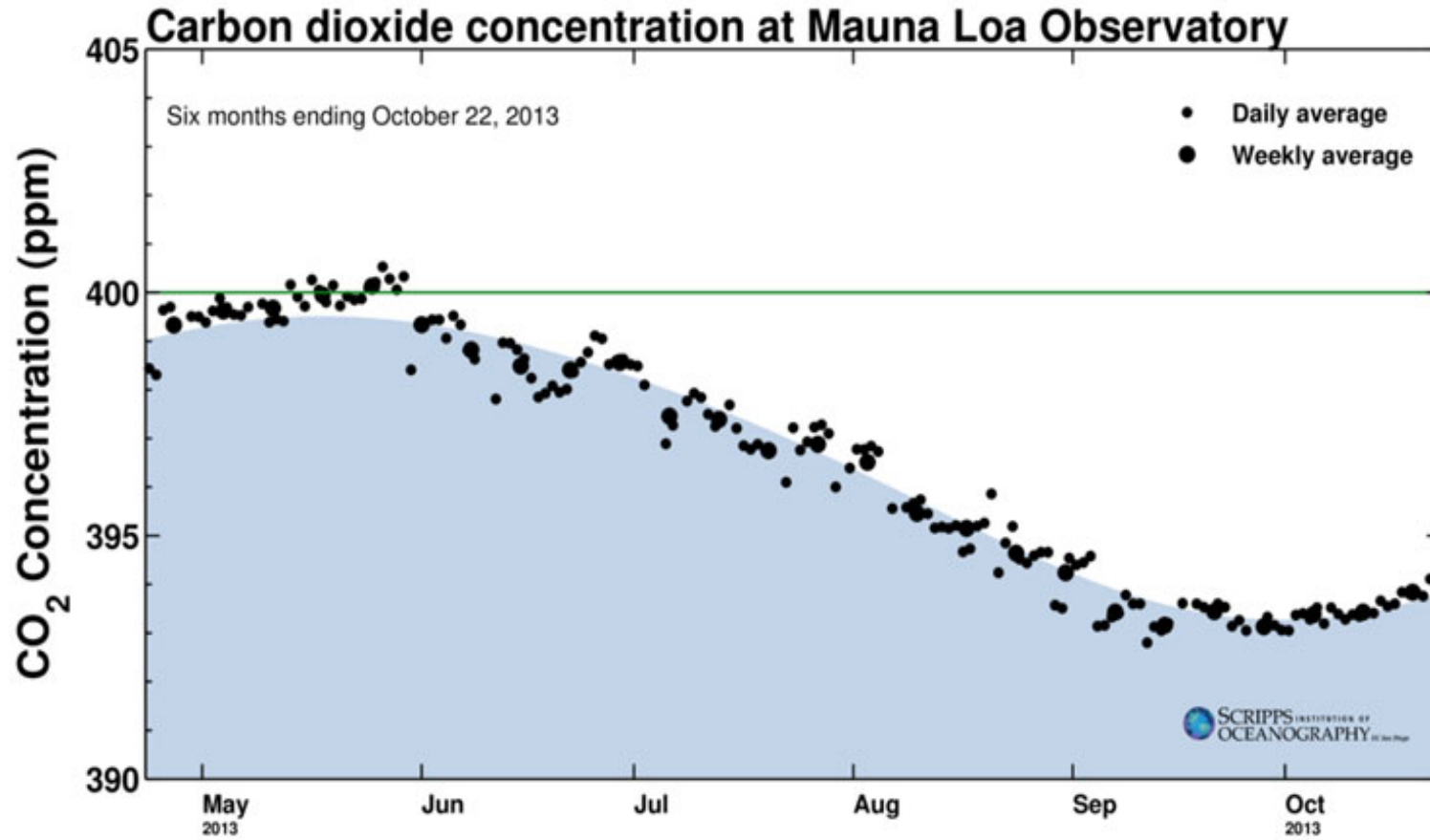
## Diagram 2. Changes in CO<sub>2</sub> over 6 months (Fall to Spring).



## **Questions for Diagram 2, Changes in CO<sub>2</sub> over 6 months (Fall to Spring):**

1. Describe the changes in CO<sub>2</sub>.
2. When is CO<sub>2</sub> highest? When is CO<sub>2</sub> lowest?
3. What do you think is causing this pattern?

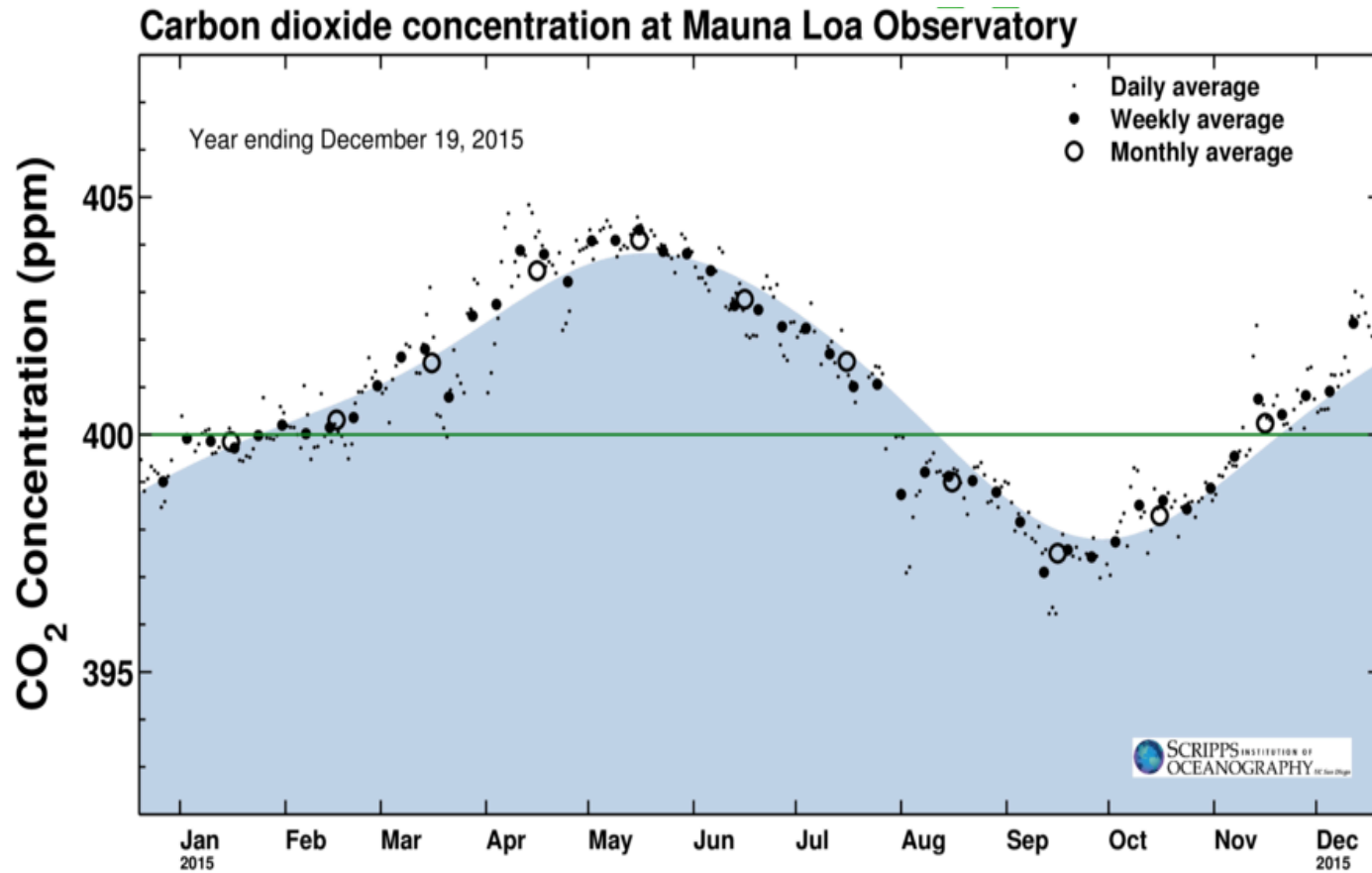
# Diagram 3. Changes in CO<sub>2</sub> over 6 months (Spring to Fall).



## Questions for Diagram 3, Changes in CO<sub>2</sub> over 6 months (Spring to Fall):

1. Describe the changes in CO<sub>2</sub>.
2. When is CO<sub>2</sub> highest? When is CO<sub>2</sub> lowest?
3. What was the highest CO<sub>2</sub>? What was the lowest?
4. What do you think is causing this pattern?

# Diagram 4. Changes in CO<sub>2</sub> over 1 year.

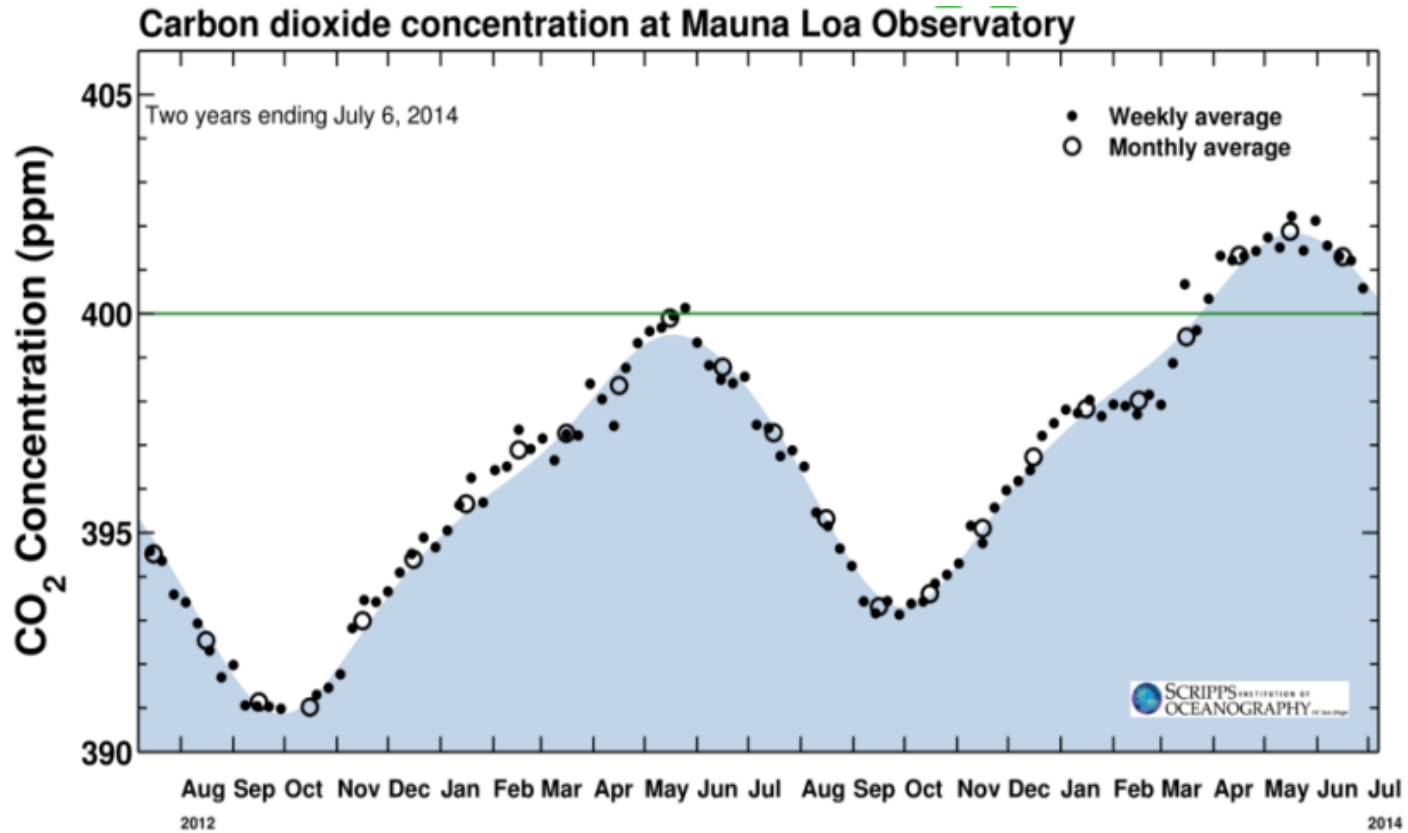




## Questions for Diagram 4, Changes in CO<sub>2</sub> over 1 year:

1. Describe the changes in CO<sub>2</sub>.
2. When is CO<sub>2</sub> highest? When is CO<sub>2</sub> lowest?
3. What was the highest CO<sub>2</sub> concentration? What was the lowest CO<sub>2</sub> concentration?
4. Why does it increase? Why does it decrease?

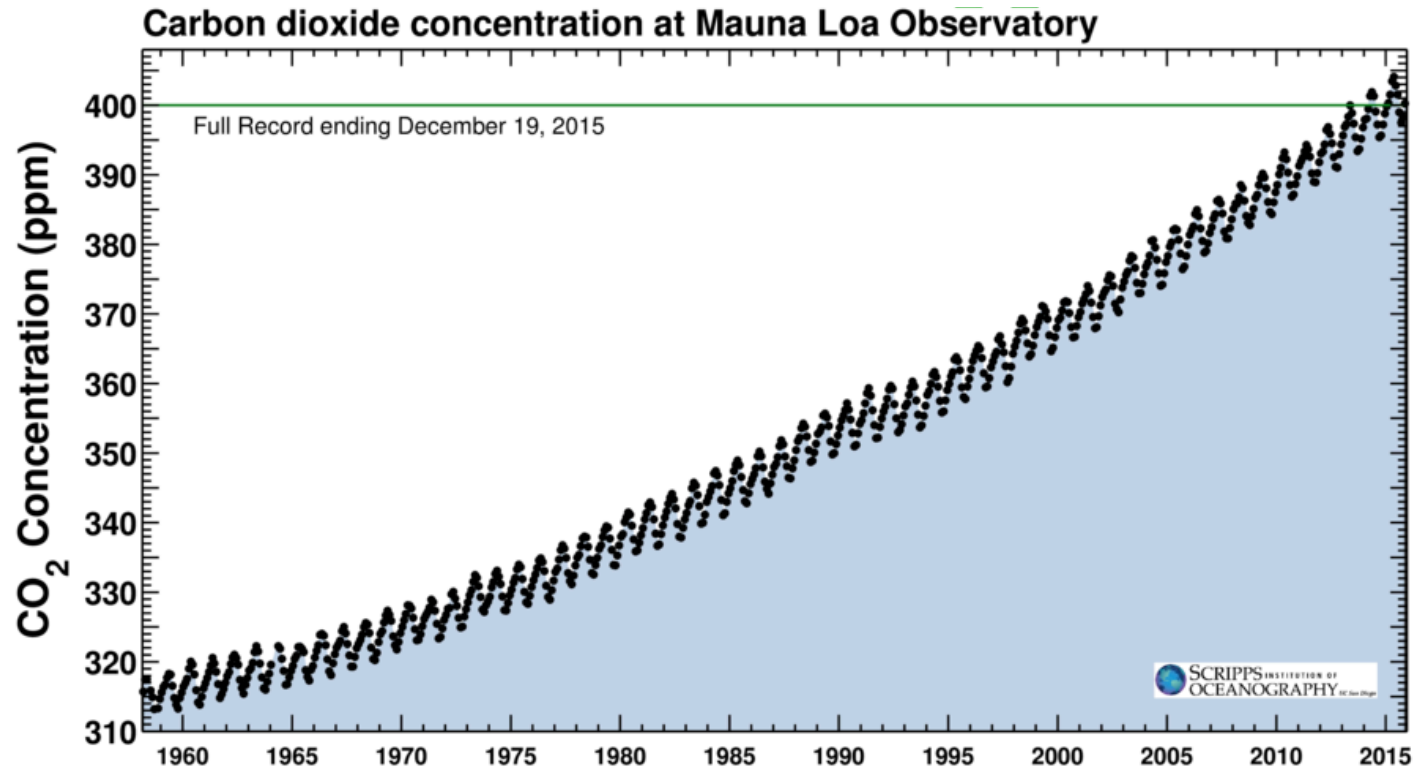
# Diagram 5. Changes in CO<sub>2</sub> over 2 years.



## Questions for Diagram 5, Changes in CO<sub>2</sub> over 2 years:

1. Are the CO<sub>2</sub> levels the same as they were in the previous year?
2. Are the highs at the same level? How do they differ?
3. Are the lows at the same level? How do they differ?
4. What do you think caused CO<sub>2</sub> levels to change?

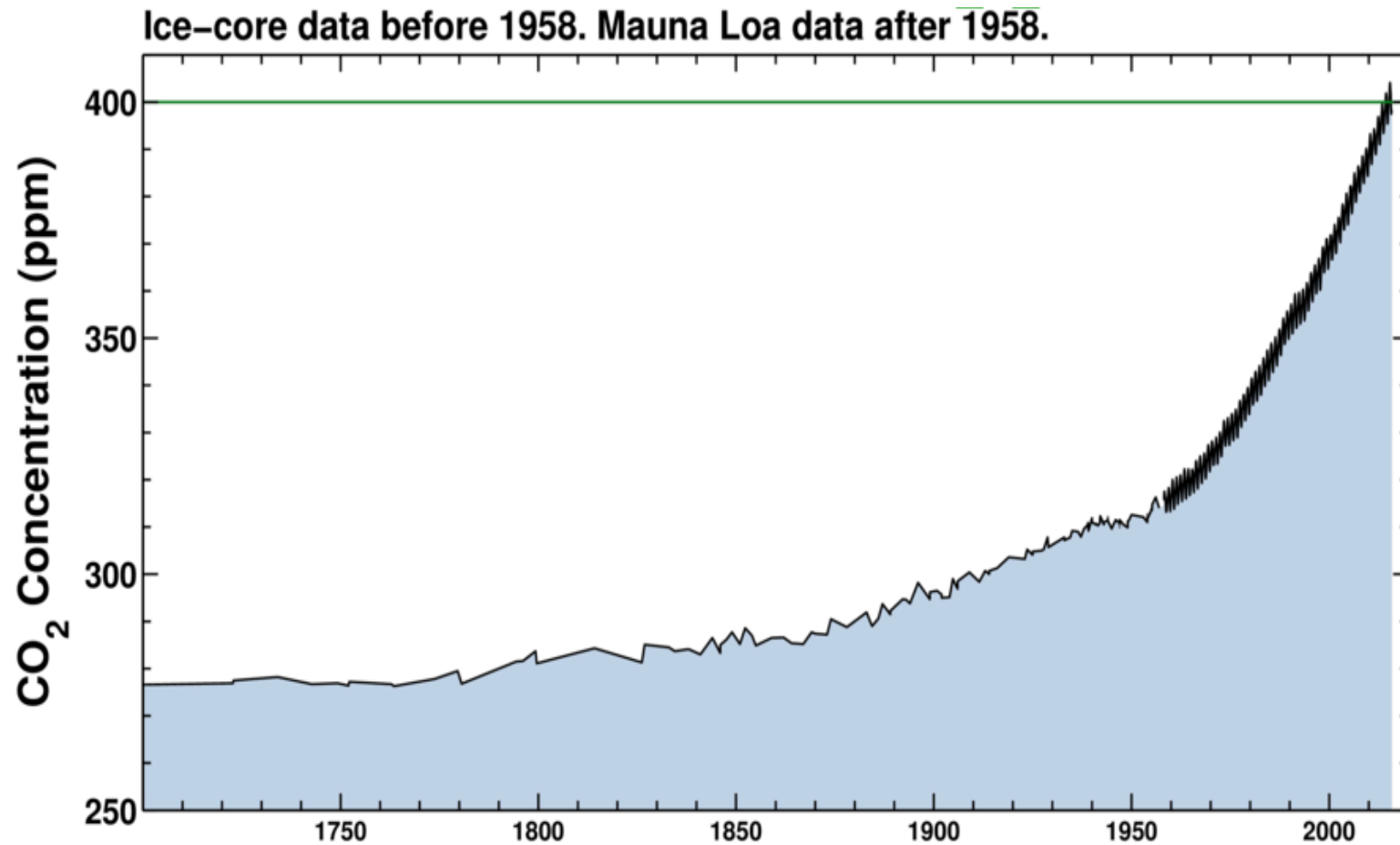
# Diagram 6. Changes in CO<sub>2</sub> from 1958 to Present.



## Questions for Diagram 6, Changes in CO<sub>2</sub> from 1958 to Present:

1. How do you explain the cyclic, zigzag pattern?
2. If there were no people, would it still rise and fall in this cycle?
3. How has the level of CO<sub>2</sub> changed over the past 50+ years?
4. Why does the line continue to go up? What is causing CO<sub>2</sub> to increase?
5. What could people do to make it stop increasing?

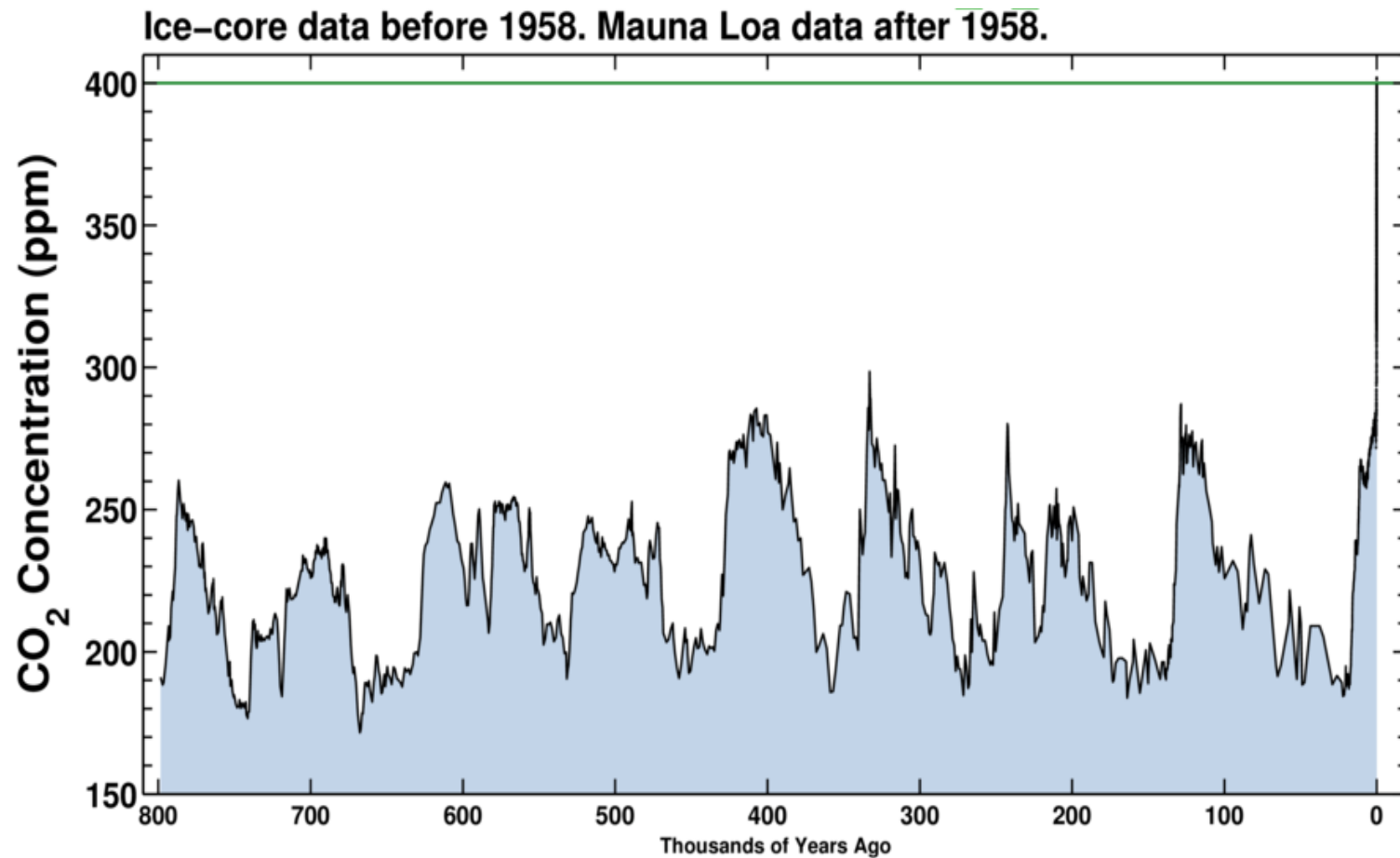
## Diagram 7. Ice core data extend the record back to 1700.



## Questions for Diagram 7, Ice core data extend the record back to 1700:

1. When did CO<sub>2</sub> rise above about 280 ppm?
2. What events in history occurred about this time?
3. When did CO<sub>2</sub> concentrations in the atmosphere begin to rise rapidly?
4. Why did CO<sub>2</sub> in the atmosphere increase so rapidly?

## Diagram 8. Ice core data over the past 800,000 years.



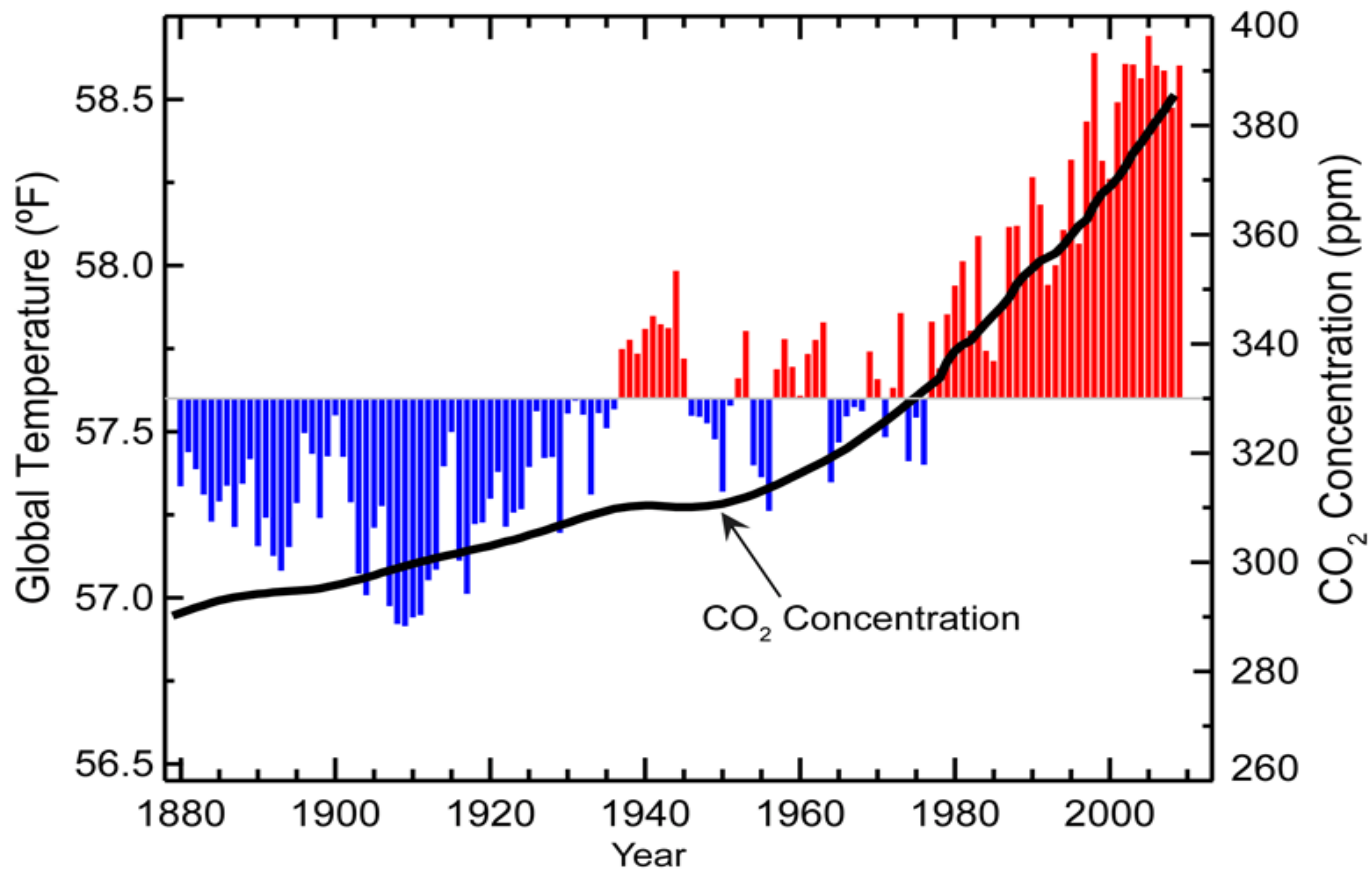


## **Questions for Diagram 8, Ice core data over the past 800,000 years:**

1. Describe how CO<sub>2</sub> changed over the past 800,000 years.
2. How high was the maximum CO<sub>2</sub>?
3. How low was the minimum CO<sub>2</sub>?
4. How long were the cycles?
5. What do you think caused this pattern?

# Diagram 9. Relationship between CO<sub>2</sub> and global temperature.

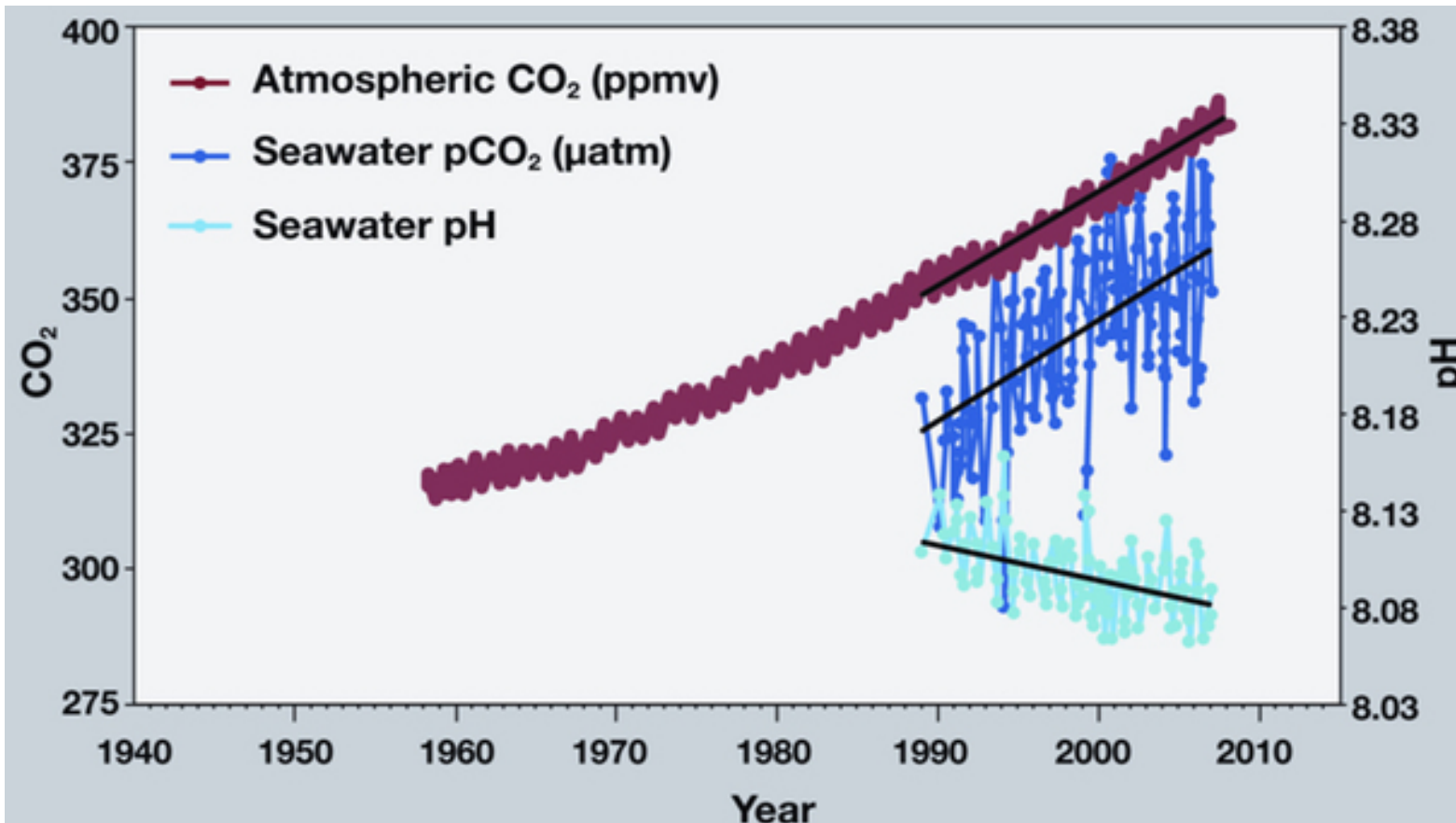
Global Temperature and Carbon Dioxide



## Questions for Diagram 9, Relationship between CO<sub>2</sub> and global temperature:

1. What do the blue lines represent?
2. What do the red lines represent?
3. What does the black line represent?
4. Is there a relationship between CO<sub>2</sub> and global temperature? If so, what is it?
5. What are some of the consequences of increasing global temperatures?

## Diagram 10. Ocean/atmosphere CO<sub>2</sub> exchange.



## Questions for Diagram 10, Ocean/atmosphere CO<sub>2</sub> exchange:

1. How does the amount of CO<sub>2</sub> in seawater change as atmospheric CO<sub>2</sub> increases?
2. How did the pH of seawater change between 1990 and 2007?
3. Is the acidity of seawater increasing or decreasing?
4. What are the consequences of increasing ocean acidity?
5. How might this affect marine life?
6. How might this affect people?