Name: Date: Period:

Anderson Environmental Systems: Air Unit

Connecting to the Paris Climate Agreement

Case study written and compiled by Ashton Hall

Part 1:

Old college lab partners, Catherine and Shannon, reconnect over Facebook one evening, catching up on life since graduation. Shannon explains that she has been doing graduate research in Germany, but will be traveling to Paris soon on Fall break. "Hey! You should join me!" suggests Shannon.

After a long awaited trip, Catherine finally arrived in Paris, France. The two friends decide to meet up at the Eiffel Tower, however, upon arriving, the crowds were even worse than Catherine imaged. There were people everywhere holding signs and chanting, and some people were even dressed in costumes. "I'll never find Shannon out here!" she anxiously thought.

When the two girls finally found each other, Catherine asked "I know the Eiffel Tower is really famous but why are there so many people here?"

"Have you ever heard of COP21? It is the 21st Conference of the Parties, or better known as the United Nations Climate Summit."

"Oh! As in climate change? Global warming? That explains the protesters dressed as polar bears!" exclaimed Catherine.

"Exactly," Shannon explained, "a lot of important world leaders have gathered to try to come to an agreement about how to improve the condition of our environment. These people have gathered to try to influence the meeting. Besides that bit of information, I'm kinda clueless too!"

The pair snapped a few quick pictures in front of the Eiffel Tower and then found refuge from the crowd in a small, quiet coffee shop. After ordering their drinks and squeezing into a booth, Shannon and Catherine utilized the free wifi at the shop to look up more about the Climate Summit.

Paris Climate Change Summit: What you need to know.

By **REBECCA KAPLAN CBS NEWS** *November 30, 2015*

Monday marks the beginning of a major two-week climate summit in Paris where dozens of world leaders will negotiate over ways to slow the pace of climate change. Here's what you need to know.

What is the meeting?

The meeting goes by several names - the United Nations Climate Summit, the 2015 Paris Climate Conference, or COP21, which stands for the 21st meeting of the Conference of Parties that are part of the United Nations Framework on Climate Change. The first COP meeting took place in Berlin in 1995, and the most famous of these was COP3, which resulted in the 1997 Kyoto Protocol to limit greenhouse gas emissions.

A 2009 conference in Copenhagen failed to produce a meaningful agreement, so world leaders are trying again to jumpstart the negotiations.

Who will be there?

About 150 world leaders and more than 40,000 delegates representing 195 countries will attend the conference in Paris.

What is the goal?

Nations are working toward a global, legally binding agreement that will lower greenhouse gas emissions in order to keep global warming below 2 degrees Celsius(35.6 degrees Farenheit) - the critical number identified by scientists. Once global warming climbs beyond that threshold, they say, the earth's land, food

and water supply would be harmed, endangering the planet's population.

The 2014 Intergovernmental Panel on Climate Change (IPCC) said the planet has already warmed by 0.85 degrees Celsius from 1880 to 2012 and could increase by another 1.5 to 4 degrees by the end of the century, compared to 1850.

Study: Climate change made last year's extreme weather worse

At the COP20 meeting in Lima last year, governments agreed to submit their pledges to limit greenhouse gas emissions. Climate negotiators are pushing for stronger commitments in Paris as a necessary step toward building the world's economic future.

"It would also show investors that the world is firmly committed to a low-carbon future, which is exactly the signal the private sector needs to go all-in on renewable energy technologies, create new markets and new jobs," Paul Bodnar, the National Security Council's senior director for energy and climate change, told reporters.

Bodnar also said that the negotiators will look for ways to have countries regularly update their greenhouse gas emission reduction targets.

The U.S. is looking to get major emerging countries more involved, as shown by President Obama's scheduled meetings with Chinese President Xi Jinping and Indian President Narendra Modi on his first day at the conference.

President Obama is also meeting with island nations that are most susceptible to changes in sea level because of climate change, including Seychelles, Kiribati, St. Lucia and Barbados.

Will they achieve their goal?

The year leading up to the Paris climate talks was preceded by some significant actions that suggest there is momentum headed into the talks.

During a summit in Beijing last year, Mr. Obama announced a U.S. pledge to cut emissions by 26 percent to 28 percent by 2025, compared to 2005 levels. China did not give a specific amount it would cut, but set a target for its emissions to peak by 2030 or earlier if possible.

The two nations combined are responsible for nearly half the world's carbon emissions.

Just before that agreement, the European Union also agreed to cut emissions 40 percent below 1990 levels by 2030.

The current climate agreement, known as the Kyoto Protocol, came under scrutiny because it never required China and other developing nations to make cuts. As a result, the U.S. did not sign onto the agreement, and it covers only about 14 percent of global emissions.

The White House said last week that that 170 countries, representing 90 percent of global emissions, have put forward their post-2020 targets for reducing carbon emissions ahead of the climate conference. And they pointed to an independent analysis that said the commitments would limit the rise in warming to 2.7 degrees by the end of the century. This would be 0.7 degrees higher than the critical 2-degree number, but it's a marked improvement over the 4-degree rise researchers said would occur without action.

Timmons Roberts, a senior fellow in Global Economy and Development at the Brookings Institution, said the Paris negotiations are promising because now people can see the effects of climate change in their lives: they feel the hotter, longer summers; "spring comes earlier, and major weather events are becoming more frequent," he said.

He also argued that improvements in the American economy, the low price of solar and wind power and a push from Pope Francis to act on climate change make success more likely.

Experts are less certain the countries will be able to reach an agreement on how to finance the fight against climate change. At previous meetings, the richer countries pledged $100 billion by 2020 to help poorer countries move away from carbon-fueled growth.

Part 1 Questions

1. What is the Paris Climate Summit and why is it so important? Give several reasons.

2. The article states that “About 150 world leaders and more than 40,000 delegates representing 195 countries will attend the conference in Paris.” Why is it important that so many countries are represented and not just the major contributors to carbon emissions?

3. Why is the economy a significant factor in negotiating climate change policy?

Examine the data below and answer the following questions:

M 7 **The greenhouse gas culprits**

Energy-related CO_2 emissions* in 2011 (selected countries)

Country	Total in million tonnes CO_2	Change between 1990 and 2011	Per inhabitant in tonnes CO_2
China	7999.6	+251.2%	5.9
USA	5287.2	+8.6%	16.9
India	1745.1	+199.7%	1.4
Russia	1653.2	-24.1%	11.7
Japan	1186.0	+11.7%	9.3
Germany	747.6	-21.3%	9.1
Canada	529.8	+23.7%	15.4
Great Britain	443.0	-19.3%	7.1
Indonesia	425.9	+191.6%	1.8
Brazil	408.0	+112.1%	2.1
Australia	396.8	+52.6%	17.4
Italy	393.0	-1.1%	6.5
South Africa	367.6	+44.9%	7.3
France	328.3	-6.9%	5.0
Poland	300.0	-12.3%	7.8
Spain	270.3	+31.7%	5.9
Thailand	243.2	+202.4%	3.5
Argentinia	183.6	+83.8%	4.5
Netherlands	174.5	+12.0%	10.4
Czech Republic	112.7	-27.4%	10.7
Greece	83.6	+19.3%	7.4
Austria	68.5	+21.4%	8.2
Finland	55.6	+2.2%	10.3
Bangladesh	54.1	+298.9%	0.4
Portugal	48.1	+22.4%	4.5
Hungary	47.4	-28.6%	4.7
Sweden	44.9	-14.9%	4.7
Denmark	41.7	-17.7%	7.4
Switzerland	39.9	-4.2%	5.1
Norway	38.1	+34.7%	7.6
Ireland	34.9	+14.6%	7.6
Luxembourg	10.4	+0.7%	20.8
Jamaica	7.6	+5.8%	2.8
Nepal	4.1	+359.1%	0.1

* "energy-related CO_2 emissions" means that the values don't include other greenhouse gases such as methane or nitrous oxide, nor do they include CO_2 emissions which arise as a result of forest clearance or industrial processes. The data is based on the sectoral approach of the IEA.

(Source: International Energy Agency (2013): CO_2 Emissions From Fuel Combustion Highlights 2013, Paris.)

4. In your opinion, who are the "climate culprits" who are most responsible for climate change? Discuss and back up your opinion with arguments.

5. Taking into consideration each countries carbon dioxide emissions, how do you think this will affect their standing at the Paris Climate Talks?

Part 2:

Later that night, after an exciting day of adventuring though the capital city of France, the friends return to their hotel for the night. “I’m still pretty curious about all of this climate talk. I’ve heard of global warming before but it’s been snowing for weeks back in Leipzig. It’s hard to understand how the world is warming up when I’ve walked through the soles of 2 pairs of snow boots just this year!” revealed Shannon.

“I know what you mean,” Catherine responded. “It all seems really complicated. You know who could help us out though? Dr. Lee!” Dr. Lee was their Ecology professor back when they were in college. “I know his specialty isn’t Environmental Science, but maybe he can help us understand it all a little better.” Catherine suggested. Before turning out the lights, the two draft an email to their former professor.

The next morning, Catherine found that Dr. Lee had already responded to their email from the night before:

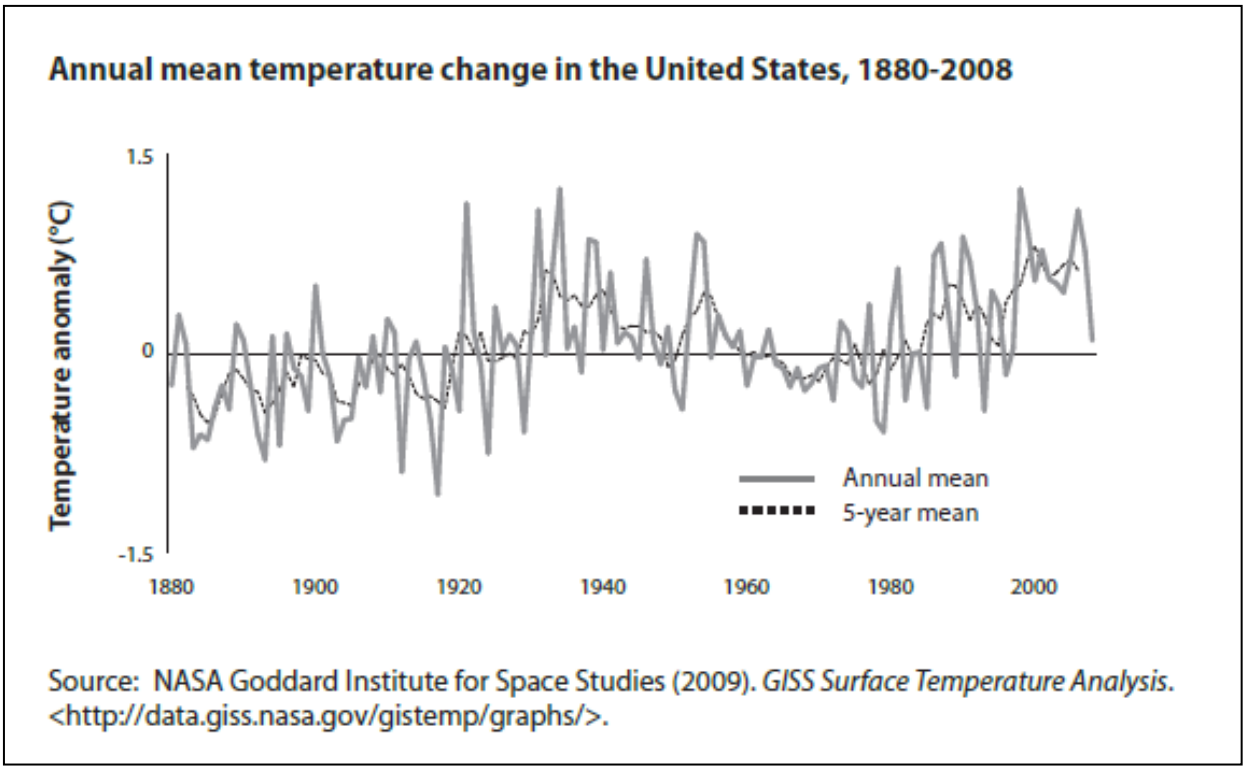
TO: catherine@gmail.com
FROM: t.lee@acu.edu
SUBJECT: Paris Climate Talks

Catherine and Shannon,
I’m glad to see that you two have remained friends and I hope you are enjoying your trip to Paris. Truthfully, I’m rather envious! This is such an exciting time to be there. The negotiations and pending agreement among these nations are crucial to the future of our environment. The last time an agreement like this was discussed was in the 1990s, called the Kyoto Protocol. It was an attempt to create a global treaty to reduce greenhouse gas emissions. Many countries ratified the treaty, but not those responsible for the greatest emissions, including The United States.

In your email you asked me to explain global warming. Though global warming (the gradual increase of the world’s average temperature) is a legitimate concern, it can be very misleading. Take for example someone who lives in New York City. Back in January 2015, New Yorkers experienced a blizzard-like snow storm that greatly impacted their daily lives. Living through a blizzard does very little to convince someone that the planet is warming up. This comes down to the difference between weather and climate. Weather is the short term changes in precipitation, wind, temperature, etc. that we see in a region. Climate is the characteristic or average weather of a region over many years. I want to talk specifically about climate change.

It is undeniable that they world is going through a climate change. In fact, the world has experienced climate changes before. There are natural events, like volcanic eruptions, that can alter the earth’s climate, however, the climate change we are experiencing now is not due to nature alone. Burning fossil fuels to the extreme extent that we do has released a huge amount of gasses into the air that are causing heat to be trapped in. This is changing the average climate of the world. We are already seeing some of the impacts of climate change now. That includes not only the global temperature increase described by global warming, but also sea levels are rising, and snow and ice cover is decreasing. Rainfall patterns and growing seasons are changing. That is why this meeting of leaders there in Paris is so significant. I have included some data to help you better understand all of this. I know it can be very confusing. Enjoy the rest of your trip!
Sincerely,
Dr. Lee

Part 2 Questions



Source: NASA Goddard Institute for Space Studies (2009). *GISS Surface Temperature Analysis*. <http://data.giss.nasa.gov/gistemp/graphs/>.

Examine the graph above and answer the following questions:

1. What is the overall trend in temperatures as indicated by the graph?

2. Is there any time period that diverges from the general trend in the graph?

3. Create two hypotheses to explain why temperatures have generally increased since 1880.

4. Create a hypothesis to explain why temperatures were cooler between 1940 and 1970.

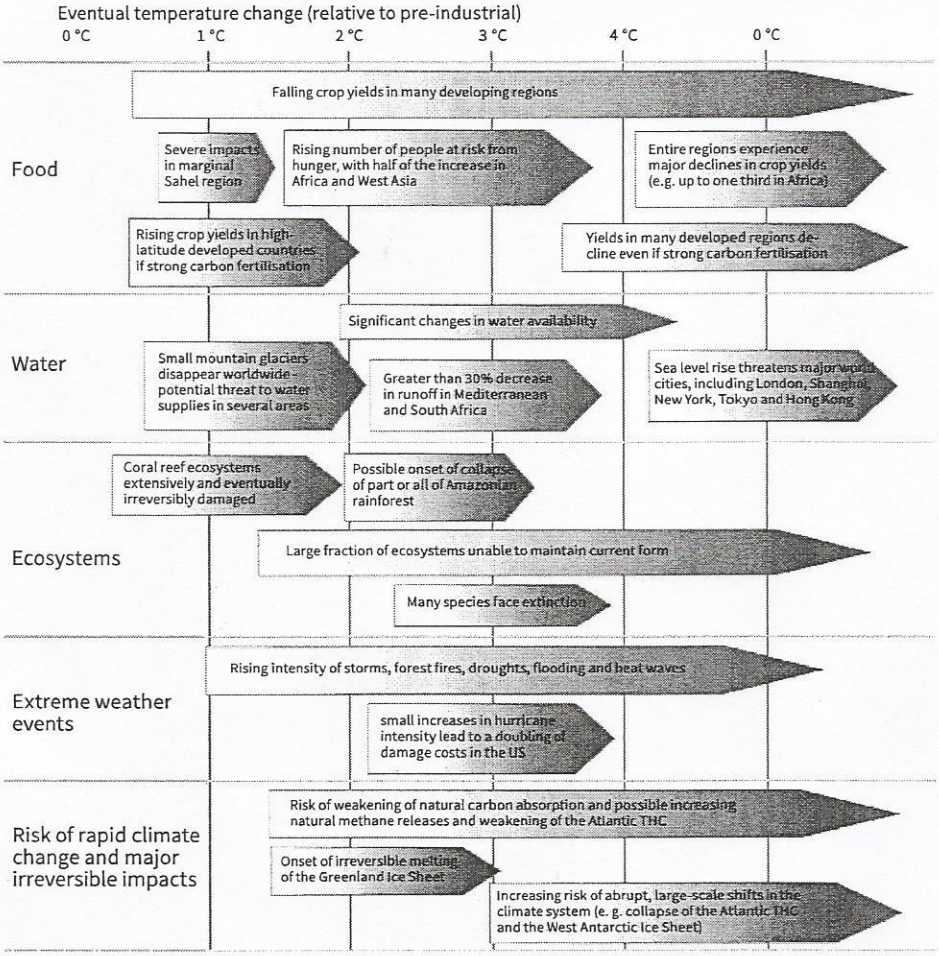
Part 3:

Over their time spent in Paris, Shannon and Catherine revisited the Eiffel Tower nightly to see the new message displayed. Messages like “ACTION NOW” and “FOR THE PLANET” shone brightly from the side of the iconic structure. One evening, the tower read “1.5 DEGREES.” “What is the significance of that specific temperature?” the girls questioned.

Part 3 Questions:

M 14

The impact of climate change for people and the environment



(Source: WBGU (2007): Climate Change as Security Risk. Springer, Berlin, Heidelberg, New York, p. 164. http://www.wbgu.de/en/flagship-reports/fr-2007-security/, accessed 26.01.2014)

Examine the diagram below and answer the following questions:

1. Express the positive and negative impacts of climate change in the form of a table.

2. Explain why many scientists are calling for the global temperature increase to be limited to 2 degrees Celsius over the pre-industrial level.

3. Which consequences could an increase in global temperature have for you personally?

Part 4:

1. Using online resources, research the outcomes of COP21 and the main points of The Paris Agreement. Summarize your finding below. Your response should be at least two paragraphs.

2. What is your personal reaction to The Paris Agreement?

3. Many leaders and citizens alike are skeptical of the plan constructed by the delegates at the meeting. What are their concerns?