Plain Script: Extreme Weather Narrative

{*Cue "Blue Marble" image*}

Welcome to Science On a Sphere. My name is ___ and I'm an educator here at ___. The image you are looking at is just one way to look at our planet but there are also many other ways.

{*Cue "Anthropocene Transportation" image* }

Take a look at this image. This is where we are on the globe {*point to location*}. These lines show transportation routes – how we move commodities, goods, and people all over the planet. Planes, roads, and ships join our local communities with the world.

The image shows how we use our planet, the whole planet, for everything that we have today. This represents people using the planet and the resources it provides, and these resources are not unlimited. We need to protect the environment from harm because we all depend on it, and it depends on us. One major environmental challenge that impacts the planet is climate change. By understanding how climate change impacts the oceans, we are better equipped to protect people, and places, all over the world.

{*Cue "Blue Marble" image* }

Have a look at our planet. How much of it is covered by ocean? When you visit the aquarium it's clear that the oceans are important for many organisms on our planet.

What may not be as apparent is that the oceans also play an important role regulating our long term weather patterns, or climate, similar to how our heart regulates the flow of blood through out body.

{*Cue "Ocean Currents" image* }

The movement of heat in the ocean, through currents, affects climate seen around the globe. Take a look at this image; red arrows show warm water currents and where they move. Blue arrows show cool water currents.

In the Atlantic, warm water from the Gulf Stream extends all the way to England. This is why England typically has a mild climate in comparison to Canada, which is just as far north.

{*Cue "SAT IR" image* }

Much in the way that the heart is a vital part of healthy body systems, the ocean is a vital part of climate systems. Just like hearts pump blood throughout bodies, the ocean pumps heat and moisture throughout the planet.

Thinking about this analogy, what does that mean for how you think about the oceans? {*Pause, giving time for visitors to offer their thoughts.*}

Yes! This also means the ocean impacts weather.

{*Cue "2012 Hurricanes" image*}

One way we can see how weather is linked to the ocean is through hurricanes. In this image we can see hurricanes from the 2012 season. {*Pause, allowing visitors to observe the globe*} Can you see the hurricanes as they form over the ocean?

{*Cue "2005 Hurricanes + SST" image*}

Now let's look at a slightly different image of hurricanes. This one illustrates that the way hurricanes form depends, in part, on how warm the surface of the ocean is. In this image, warmer water is indicated by reds and yellows; colder water appears blue. Where do you see the hurricanes developing? {*Pause*} Hurricanes form in warm water, where it appears red. They typically need ocean surface temperatures of over 79° Fahrenheit to form.

{*Cue "Typhoon Haiyan + SST" image*}

Watch as Typhoon Haiyan forms over the warmer ocean waters. As we saw previously, hurricanes and typhoons form in warm water.

Now consider this: What would happen if the ocean got warmer? {*Pause*}

That's exactly what's happening across the globe now. As we burn fossil fuels like coal, oil, and natural gas, we add more carbon dioxide gas into the atmosphere. Some carbon dioxide, or CO2, is needed for life processes. We can call this regular CO2. But CO2 is not just something that plants breathe in and we breathe out. It's also something that gets put into the atmosphere when we drive our cars or burn any kind of fossil fuel. These activities are putting a lot of CO2 into the atmosphere and ocean. We can call this rampant CO2 because there is so much of it and it's getting out of control.

As this rampant carbon dioxide builds up, it acts like a blanket, trapping heat inside. This trapped heat warms our ocean and atmosphere.

This can cause a disruption or shift in systems on our planet.

Our warmer ocean pumps more moisture and heat into the air. This provides the fuel for more intense hurricanes.

{*Cue "Blue Marble" image}*

As the heat in our ocean and atmosphere increases, we can expect to see an increase in the number of strong hurricanes. While the total number of future events is uncertain, it is likely that those that do occur will be more intense. Hurricane Katrina in 2005 (which we saw earlier) and Typhoon Haiyan in 2013 are examples of the types of intense storms that are likely to occur in the future.

The heart of our global system driving climate and weather has already been disrupted. Just like heart health can be improved by changes in behavior (like diet and exercise), the health of the planet's heart can

be improved by changes, too. Just like we monitor our hearts to keep them healthy and prevent them from damage, it's important to monitor the oceans so that they can continue to move the right amount of heat and moisture through the climate system and prevent these storms from getting more intense.

Communities are coming together both locally and globally developing innovating solutions. We can help by reducing our reliance on fossil fuels, which will reduce the amount of heat trapping gases in our atmosphere.

{*Cue "Nighttime Lights + Solutions" image*}

In some communities, energy companies are switching at least a third of the fossil fuels they use to cleaner energy sources such as solar arrays, wind turbines, and wave energy buoys. There are other choices we can make by supporting hybrid and clean fuel busses, mass-transit programs, green roof projects, and municipal solar panels.

These are all ways of moving toward energy sources that don't contribute to the heat-trapping blanket.

Following climate change groups on Facebook and Twitter such as 350.org and the Union of Concerned Scientists, or joining a local rideshare group or bike share program are just a few ways that we can come together as a community, support one another, and be part of the solution.

Are there any groups in your area that you can join? Are there any online communities or websites you like to follow?

Learning about your options, voicing your opinions, and promoting and voting for causes you believe in are all ways to make change happen. Discussing these ideas with your families, neighborhoods, and communities is a great start. What will you do today?

Thanks for joining us today for our Science on a Sphere program. I will stick around for a few more minutes if you have any questions. Enjoy your visit!