



The following is an excerpt from the Indigenous Environmental Network's *Climate Justice and Indigenous Peoples Training Manual* which was created in 2008. This manual was prepared by Jihan Gearon with the help of the Environmental Justice and Climate Change Initiative.

Although this manual is tailored for Indigenous Peoples, it is applicable to many communities who are facing environmental and climate injustices. We have offered this section of the manual for GGJ and IEN members, affiliates, and allies to use as an educational tool to begin discussions about climate justice.

We hope that you use this as part of your actions on October 12, 2010 – The Global Day of Action for Climate Justice: Change the System, not the Climate!

ACTIVITY #3: CLIMATE SCIENCE QUIZ

Facilitator:

In this activity, you will simply read the questions and answers below. Participants will stand up or sit down based on your questions. A script for introducing the activity, and transitioning to the next activity is also provided. You can use the IEN *Climate Science* PowerPoint, slides 4-12 to do the quiz, or you can simply read the questions out loud, without using the PowerPoint presentation.

Introductory Script:

There are a lot of facts and figures circulating around climate change. We're going to explore which ones are true and which ones are false. I will read out some statements about climate change. If you think the statement is true, then stand up. If you think the statement is false, then stay seated. We'll discuss each one afterwards, and go on to the next question when everyone is seated.

Questions and Answers:

1) Global warming is still not proven scientifically?

False. According to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) released in 2007, "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."

FYI: The IPCC is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP), and was established to provide the decision-makers and others interested in climate change with an objective source of information about climate change. It is the place to go for climate information.

2) Temperature and carbon dioxide levels have been closely related throughout history?

True. We will talk about this more later.

3) Humans have never experienced a drastic climate change like we are faced with today?

OBJECTIVE: To gauge participants understanding of climate science and to challenge participants to begin thinking about the intricacies of climate justice.

MATERIALS: If using the IEN *Climate Science* PowerPoint presentation, you will need a laptop and PowerPoint projector.

PREP: If you're using the PowerPoint presentation, remember to set up the laptop and projector.

TIME: 15 minutes

False. Hunter-gatherers experienced climate change, but humans as agriculturalists and urban people have not. Climate change will severely disrupt modern human activity.

4) Current temperatures are higher than they have been for the past 1,000 years?

True. It may be longer than that, but data is uncertain. Thermometers have only been used for the past 150 years; before that they used ice cores – drilling into Antarctic ice and analyzing it to determine carbon content and temperature.

5) Farting contributes to climate change?

True. Especially cow farts. They release a lot of methane, which is 21 times more potent than carbon dioxide.

6) The hole in the ozone layer lets in UV (ultraviolet) rays that contribute to climate change?

False. The ozone layer problem is not directly related to climate change. Chlorofluorocarbons, or CFCs, were a chemical that was destroying the ozone layer. However, they were banned in 1989 under the Montreal Protocol. Their replacements, HCFCs, are a greenhouse gas.

7) Land around the equator is warming the fastest of the landmass on earth?

False. The land at the poles is warming faster because of the albedo effect. The albedo effect occurs when ice melts and the water or land it used to cover absorbs the sunlight. Normally, it would be reflected, but the uncovered land or water heats up more than the ice would have.

8) Indigenous Peoples more affected by climate change than other populations?

True. Indigenous People are disproportionately affected by climate change in various ways. We will talk more about this during the climate justice portion of the website.

9) By the year 2100, global temperature will have risen 3 degrees Celsius?

Trick Question! Predictions range from 0.6 to 6 degrees Celsius. We don't know because it depends on what action we take to curb human emissions. Figure 1.2 shows pictorially, the different features of various climate models.

Transitional Script:

Now that we know more about climate change, let's go into more detail about the science.

ACTIVITY #4: CLIMATE SCIENCE POWERPOINT PRESENTATION

Facilitator:

In this activity, you will simply present slides 14 – 32 of the IEN *Science* PowerPoint presentation. The notes for each slide are embedded in the PowerPoint (in “Normal View”) and are also written below. This portion of the presentation covers the greenhouse effect and how it relates to climate change, evidence of climate change, and the causes and affects of climate change.

Remember to make any adjustments to the presentation, if necessary. For example, if you are presenting on a particular region, you might want to add a slide outlining the affects of climate change on that region specifically. Also, some of the slides include animation. Make sure to go through the PowerPoint beforehand so you know where you need to click for animation.

Script for Each Slide:

Slide 14: This slide provides a review of the greenhouse effect. First, notice the earth is surrounded by a layer called the atmosphere, which contains several greenhouse gases such as carbon dioxide, methane, and water vapor. It shows visible light from the sun hitting the earth and being sent back into space as infrared light, also known as heat. You can also see that some of the heat is unable to escape and is bouncing back toward earth. The heat is unable to escape because of the greenhouse gases in the atmosphere. Thus, the more greenhouse gases (and the more carbon) in the atmosphere, the less heat is able to escape.

Slide 15: Venus is an example of a very strong greenhouse effect. Venus has 300,000 times as much carbon dioxide in its atmosphere as Earth does, making its surface hot enough to melt lead.

Slide 16: The greenhouse effect is not inherently bad. To see why, we need look no further than the moon. The moon is the same distance from the sun as the Earth is but does not have an atmosphere to protect it or retain the sun’s heat. Thus the natural greenhouse effect that makes Earth warm enough to sustain life - with an average surface temperature of 60 F – is not present on the moon. Without an atmosphere for protection or heat maintenance, the moon sees daily temperatures of 250 F and nightly temperatures of -10 F. It is only when we add too much carbon and other greenhouse gases to our atmosphere that it begins to hold too much heat, which changes our climate.

OBJECTIVE: To provide participants with an overview of how climate change works.

MATERIALS: IEN *Science* PowerPoint presentation, laptop, and PowerPoint projector.

PREP: Set up the laptop and projector. Go through PowerPoint and make any needed additions or deletions.

TIME: 30 minutes

Slide 17: This graph depicts temperature (in blue) and carbon dioxide levels (in red) over the past 450 thousand years. Low temperature periods are ice ages; high temperature periods are called interglacial periods. As you can see, temperature and carbon dioxide level are closely correlated. Higher carbon dioxide has always been associated with higher temperature. Looking at today's carbon levels, we see that it is significantly higher than ever before during this time period. It may seem that the temperature fluctuations depicted here are insignificant, but note that our last ice age saw average temperatures that were only 8-10 C colder than they are today. A few degrees make a big difference, as we will continue to show throughout this presentation, and a small increase in carbon can cause big changes.

Slide 18: Many people say, climate change can't be a big deal because it's been hotter than it is now. This is true, tens of millions of years ago the temperature was warmer than it is today. BUT it's not the temperature and CO2 levels alone that are alarming, it is the rate that CO2 and temperature are rising that is the major concern. It takes thousands of years of gradual climate change for plants and animals to adapt to new temperatures, and the animals and plants alive today are adapted to much cooler temperatures than those 10 million years ago were. It is also important to note that all of what is considered 'civilization'—agriculture and cities—has developed in a period of relative climate stability. Humans as hunters and gatherers have experienced major changes in the climate. But humans as farming and urban people have never experienced the kind of change in climate that human actions could cause in this century. This doesn't necessarily mean climate change would cause the end of civilization, but climate change could certainly cause some disruptions in civilization. This is another good thing to point out to people who say 'but the climate has changed in the past, so why should we worry.'

Slide 19: This graph gives us data from the past 150 years – the period during which people have been making good records from thermometers. It shows us that clear temperature increases have occurred in the last 50 years. The temperature has increased about half a degree C from what it was around the middle of the 20th century. [FYI: The line on the graph is the smoothed trend, evening out the variation in individual years. The zero line is defined to be the average temperature from 1961-1990.]

Slide 20: This graph looks back even further to show us that current temperatures are the highest in *at least* 1000 years (probably longer than that—data isn't good enough to know for sure). The red is temperatures that have actually been measured with thermometers. The blue is temperatures determined from tree rings, corals, ice cores, and historical records. The black line is again smoothing out individual year variations. [FYI: The gray is the error range (which is very small for recent measurements – made with more precise tools – and large for those further back in time). The zero line on this graph is also defined to be the average temperature from 1961-1990.]

Slide 21: The burning of fossil fuels is the main cause of climate change, but it is not the only one. Deforestation releases carbon in plants to atmosphere. Methane is also a greenhouse gas and is produced in cow farts (also from decomposing material in rice paddies and in landfills—anywhere decomposition takes place without air). N2O (Nitrous

oxide) produced from fertilized fields, CFCs (chlorofluorocarbons) which used to be used in refrigeration, and a few gasses used in industrial processes are also minor contributors to the increased greenhouse effect.

Slide 22: However, carbon dioxide emissions from the burning of fossil fuels is the main cause of climate change. The changes in temperature shown in the previous graphs have happened at the same time as emissions of carbon dioxide by human activities have increased. The increase in temperature also corresponds to the increase in carbon dioxide levels in the atmosphere. It helps to remember some key historic events when looking at the emissions human have produced over the past 250 years:

- Coal burning began with the industrial revolution around 1800. But in the United States wood was used as a fuel more than coal until after 1850.
- After 1900 emissions increased faster with the rise of automobiles and electricity.
- The greatest increase accompanied suburbanization and increasing affluence since 1950.
- The great depression and the oil shocks of the 1970s appear as small blips in the emissions graphs.

Slide 23: This slide gives us information about global anthropogenic (human caused) emissions. Graph (a) shows global annual emissions of anthropogenic GHGs from 1970 to 2004. Graph (b) shows the share of different anthropogenic GHGs in total emissions in 2004 in terms of CO₂-eq (carbon dioxide equivalent). Graph (c) shows the share of different sectors in total anthropogenic GHG emissions in 2004 in terms of CO₂-eq. (Forestry includes deforestation). What we can see from these graphs is:

- GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004.
- Carbon dioxide (CO₂) is the most important anthropogenic GHG. It's annual emissions grew by 80% between 1970 and 2004.
- Global atmospheric concentrations of CO₂, methane (CH₄), and nitrous oxide (N₂O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.

Also, global increases in CO₂ concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. Observed increase in CH₄ is very likely predominantly from agriculture and fossil fuel use. Increase in N₂O is primarily due to agriculture. [FYI: From IPCC website]

Slide 24: Many different projections have been made regarding how warm the earth's surface will become during this century. There is a wide range of temperature projections. The projections range about 1-6 C (2-11F) increase and center at around 3C (5-6F) increase in the earth's surface temperature by 2100. Look at the bars at right. Each bar represents different amounts of fossil fuel burning. So, while there is some uncertainty about which projection will be most accurate, the real uncertainty is what humans will do! If we drastically cut our emissions all projections show that we will be much better off than if we continue with business as usual.

Slide 25: The most obvious evidence of climate change and global warming is melting ice such as glaciers and permafrost. This is a picture of Zugspitze Glacier in Germany in 1890...and 2003. In case you're wondering about the color in the picture from 1890, it has been digitally enhanced.

Slide 26: This is Vernagt Glacier in Austria in 1985...and 2000.

Slide 27: This is a shoreline near Muir Point on Muir Inlet along Alaska's Glacier Bay in 1899...and 2003.

Slide 28: This is Pasterze Glacier, Austria in 1875...and 2004.

Slide 29: This is Portage Glacier, Alaska in 1914...and 2004.

Slide 30: This picture shows us what happens when permanently frozen ground or permafrost – less visible than a glacier but also a good indicator – begins to melt. You can see this building is sinking into the ground. Melting permafrost in the arctic is damaging buildings and roads.

Slide 31: Climate change is more than increased temperatures and melting ice. Our climate system is very intricately connected and balanced. Climate change will have several effects including, but not limited to: decreased air quality, increased extreme weather events, loss of land, increased spreading of diseases, extinction of species, changes in weather patterns (which could cause changes in climate such as desertification), decreased resources, social conflicts, and as we're seeing in the arctic, displacement of peoples.

Slide 32. This slide provides a very quick snapshot of how Indigenous People are being affected by climate change and is focused on the most obvious affects that we see today. For example, Indigenous people in the arctic region are experiencing shorter winters, which are disrupting the lifecycles of the plants and animals they depend on. In the Arctic and in the Pacific, a rising sea level is forcing several communities on the coast and islands to abandon their homes and traditional lands. Where I'm from: _____ . Furthermore, many Indigenous communities are already suffering the affects of natural resource development: oil spills, strip mining, contamination of water resources, desecration of land, & assaults on tribal sovereignty. And furthermore, many of the solutions to climate change are having negative affects on Indigenous communities.

Transitional Script:

In our next activities, focused on climate justice, we will take a closer look at the affects of climate change on Indigenous Peoples and local communities.

ACTIVITY #5: CLIMATE CASES

Facilitator:

In this activity you will break up your audience into small groups, guide their discussions about the provided cases studies (Appendix C), allow them to present their thoughts, and facilitate a group discussion that ensures their understanding of climate injustices against Indigenous Peoples.

This activity allows participants to see that climate change disproportionately affects Indigenous Peoples, as well as its causes and many of its proposed solutions. They will be asked to put themselves in the shoes of an affected community to understand the complicated situations they are going. And it also asks participants to think about what they can do to help these communities as outsiders.

This activity can be frustrating and disheartening for participants, so be aware of that. Part of your job is also encouraging participants to begin to see solutions and find sources of hope! A script for introducing the activity, guiding the group discussion, and transitioning to the next activity is also provided.

Introductory Script:

We are going to look at a few case studies of climate injustice in action. We will break into small groups and everyone will get a case study. Your group assignment is to read the scenario, answer the questions at the bottom, and brainstorm ideas for overcoming the injustice. You will then have to draw your scenario – including the problem, assets, barriers, and solutions. You'll have 20 minutes to work in groups and five minutes to report back to the larger group.

- ❖ **Break the participants into groups of four to seven (groups larger than this will be too big) and give each group a case study, one large sheet of paper, and markers.**
- ❖ **For the next 20 minutes, walk around and facilitate discussions within the groups. If they are having trouble, help them identify answers to the questions. Let them know when they have ten and five minutes left.**

OBJECTIVE: To demonstrate that Indigenous communities are disproportionately affected by climate change, its causes, and many of the proposed solutions.

MATERIALS: Copies of case studies (one case study for every four to seven people), large sheets of blank paper (one per group), markers.

PREP: Make enough copies of Appendix C so there is one case study for every seven people, at least. It is okay if more than one group do the same case study. Make sure there are enough large sheets of paper so there is one for every group. And make sure there are enough markers.

TIME: 60 minutes

- ❖ **Encourage creativity, expansion on the information presented, and loose interpretation.**
- ❖ **Make sure that everyone is participating in the activity.**
- ❖ **Have each group present, with a time limit of five minutes each.**

Group Discussion Script:

Thank all of you for your presentations! I hope that activity helped you all to see the many ways in which Indigenous People are affected by the huge issue of climate change. Now let's wrap up with ten minutes of group discussion. I'll ask some questions and any of you, feel free to share your thoughts and answers.

- Do any of you relate to the communities we discussed in this activity? How?
 - What links all the communities that have been discussed in this activity? (Hopefully you will see answers like: organizing, strength in numbers, culture, etc.)
 - Which, if any, of the communities discussed in this activity are key contributors to climate change? (If someone points out that oil companies employ some of the communities, ask: how can this tie be broken?)
 - What would make you more hopeful that positive change could occur for the communities discussed?
- ❖ **Feel free to add more questions or tweak any of the above to make the discussion more beneficial to your audience.**
 - ❖ **Make sure that everyone participates in this discussion. Don't let one or two participants dominate the conversation and similarly, encourage those participants who have been most quiet to give their input.**

Transitional Script:

Thanks everyone for participating in that discussion. You might think that we just painted a picture of hopelessness, but not all is lost for our communities. Strength in numbers is a key asset, but let's also examine how we can guide climate policy to ensure that justice occurs.

KIVALINA, ALASKA

Kivalina is a traditional Inupiat Eskimo village of about 390 people about 625 miles northwest of Anchorage. It is built on an eight-mile barrier reef between the Chukchi Sea and Kivalina River. Sea ice traditionally protected the community, whose economy is based in part on salmon fishing plus subsistence hunting of whale, seal, walrus, and caribou. But sea ice that forms later and melts sooner because of higher temperatures has left the community unprotected from fall and winter storm waves and surges that lash coastal communities. Therefore, much of the island is being eroded and the community has to relocate, at a cost of hundreds of millions of dollars. Furthermore, their lands have been expropriated and their rights diminished through the Alaska Native Claims Settlement Act (ANCSA). Kivalina is now suing two dozen oil, power, and coal companies, claiming that the large amounts of greenhouse gases they emit contribute to global warming that threatens the community's existence.

Discuss and answer the following questions with your group. You will report back your answers to the rest of the group.

- 1) In what ways is this community being affected by fossil fuel development and/or climate change?
- 2) Why is this a climate justice issue?
- 3) What other challenges and barriers does this community face?
- 4) What assets and/or opportunities are available to this community?
- 5) How is this community's situation unique, in comparison to the rest of the United States?
- 6) How do you remedy the situation?

PASSAMAQUODDY, MAINE

Tribal elected leaders of the Passamaquoddy tribe and an Oklahoma-based company, Quoddy Bay LLC have been pursuing a Liquefied Natural Gas (LNG) energy project. This project would result in the building of a large LNG complex to be built in Quoddy bay, which would have negative affects on Split Rock, a ceremonial and cultural site to the Passamaquoddy, and the rest of the bay. This LNG complex will negatively affect the health, environment, and cultural identity of this community. On December 16, 2005, Quoddy Bay LLC pre-filed an application for final regulatory approval with the Federal Regulatory Energy Commission (FERC), ushering/allowing them through the Federal permitting process. The FERC processes are marked by legal complexity and expense positioning this community at a disadvantage. A community group is currently involved in ensuring that its members, as well as their descendant's rights are protected, even as they struggle with local government, federal court, and federal and state agencies. LNG is seen by many as a solution to climate change and U.S. dependence on foreign oil.

Discuss and answer the following questions with your group. You will report back your answers to the rest of the group.

- 1) In what ways is this community being affected by fossil fuel development and/or climate change?

- 2) Why is this a climate justice issue?

- 3) What other challenges and barriers does this community face?

- 4) What assets and/or opportunities are available to this community?

- 5) How is this community's situation unique, in comparison to the rest of the United States?

- 6) How do you remedy the situation?

FORT BERTHOLD, NORTH DAKOTA

Descendants of the Mandan, Hidatsa, and Arikara Nations also known as the Three Affiliated Tribes, live on the Fort Berthold Indian Reservation, which is located in west central North Dakota. The Missouri River traverses the middle of the reservation and divides the reservation into three separate areas. The total land area of the reservation is 988,000 acres with 457,837 acres in tribal and individual Indian ownership. Cancer, asthma, heart disease, thyroid disorder, and many other chronic health conditions and associated deaths are extreme amongst the population of the Mandan, Hidatsa and Arikara. Moreover, with more frequent hotter days, smog in the area has gotten worse. An oil refinery is proposed to be sited within the boundaries of the Fort Berthold Indian Reservation. This community is already disproportionately affected by the toxic polluting effects of several lignite coal power plants, several coal mines, a coal gasification plant, oil wells and herbicide and pesticide from farm operations in their direct proximity. A grassroots organization was formed in an effort to stop the building of this refinery. This refinery is seen as a solution to U.S. dependence on foreign oil.

Discuss and answer the following questions with your group. You will report back your answers to the rest of the group.

- 1) In what ways is this community being affected by fossil fuel development and/or climate change?
- 2) Why is this a climate justice issue?
- 3) What other challenges and barriers does this community face?
- 4) What assets and/or opportunities are available to this community?
- 5) How is this community's situation unique, in comparison to the rest of the United States?
- 6) How do you remedy the situation?

TUVALU

Tuvalu, formerly known as the Ellice Islands, is located in the Pacific Ocean midway between Hawaii and Australia, and is the fourth smallest nation in the world. Tuvaluans are Polynesian people and the traditional community system still exists to this day. Subsistence farming and fishing remain the primary economic activities. Tuvalu, meaning “eight standing together” because it is made up of eight islands, only sits three feet above sea level. In recent years Tuvalu has made international headlines because due to a rising sea level caused by climate change, the island is disappearing into the ocean. Because of the loss of their land and homes, many people are moving to New Zealand. However, no one has stepped up to pay for relocation of these first “climate refugees.”

Discuss and answer the following questions with your group. You will report back your answers to the rest of the group.

- 0) In what ways is this community being affected by fossil fuel development and/or climate change?

- 1) Why is this a climate justice issue?

- 2) What other challenges and barriers does this community face?

- 3) What assets and/or opportunities are available to this community?

- 4) How is this community’s situation unique, in comparison to the rest of the United States?

- 5) How do you remedy the situation?

ECUADOR

In Ecuador, the Dutch FACE (Forests Absorbing Carbon dioxide Emission) Foundation started a carbon offset project in the Andean Páramo in the northern Andes. Carbon offsetting is the act of mitigating greenhouse gas (GHG) emissions by paying for emissions reductions to take place elsewhere instead of reducing one's own emissions. This particular project involved the planting of 220 square kilometers (~85 square miles) of eucalyptus and pine trees. An investigation into the project found that it has very negative impacts on the land, and on Indigenous and peasant communities who use the area for cattle grazing. The Páramo ecosystem is fundamental for the regulation of regional hydrology and a source of water for most of the population in the Andes – the great amount of organic matter enables these soils to retain much water. The introduction of the exotic tree species transforms and damages the fragile soil structure and affects other flora and the fauna. Under the terms of the contracts signed, FACE does not pay any kind of rent for the community-owned lands while it requires that the communities do not use these lands for any activity other than maintenance of the carbon sink for the duration of the contract. Activities such as grazing are banned. This means families owning cattle have to rent land for their animals, an expense that previously did not exist, and/or reduce their heads of cattle. Projects such as these are occurring in communities all over the world and are being pushed by many as a solution to climate change.

Discuss and answer the following questions with your group. You will report back your answers to the rest of the group.

- 1) In what ways is this community being affected by fossil fuel development and/or climate change?
- 2) Why is this a climate justice issue?
- 3) What other challenges and barriers does this community face?
- 4) What assets and/or opportunities are available to this community?
- 5) How is this community's situation unique, in comparison to the rest of the United States?
- 6) How do you remedy the situation?