Today I Learned About National Security

"Rising sea levels and more frequent intense storms put individual families and whole communities at risk, while pushing the limits of our collective capacity to respond."
Secretary of Defense Lloyd J. Austin III, April 2021
TILclimate podcast: Today I Learned About National Security

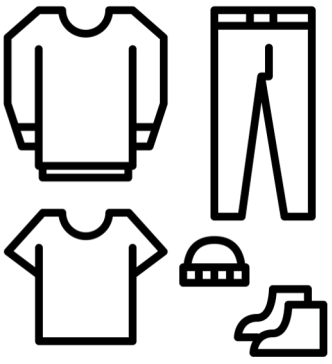
What is National Security?

National security is the need for governments to keep their people and nation safe. In modern times, that means everything from diplomacy and foreign relations to military might to environmental and economic policy. In the US, the National Security Council includes the following departments and agencies:
President and Vice President
Department of State (foreign relations)
Department of the Treasury (economic policy)
Department of Defense (military)
Department of Energy (energy and nuclear weapons)
Department of Justice (laws and courts)
Department of Homeland Security (domestic and immigration)
Representative to the United Nations (foreign relations)
US Intelligence Community (domestic and international intelligence)
US Agency for International Development (international aid)

Climate Change Causes and Effects

As we burn fossil fuels like coal, oil, and natural gas, we release large amounts of carbon dioxide into the atmosphere. This carbon dioxide (and other related gases) acts like a blanket, trapping heat. This trapped heat is causing dramatic changes to the climate and weather around the world.

Climate vs Weather



The weather happens every day and changes every hour. Weather is the short-term changes in temperature, humidity, cloud cover, wind, and other factors that determine whether you need to wear a jacket or not. Climate is long-term weather. Climate is measured in decades and centuries, not days and months. The climate determines what kinds of clothes you need to own, while you look to the weather to figure out what to put on each day. If you live in Alaska, you might own both shorts and a heavy winter jacket. If you live in Florida, you might only own shorts.

clothing by Nototype from the Noun Project

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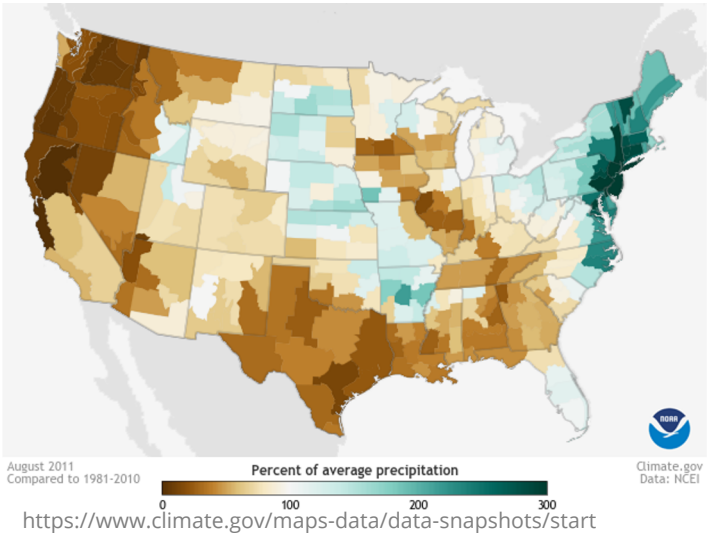
What Kinds of Changes?

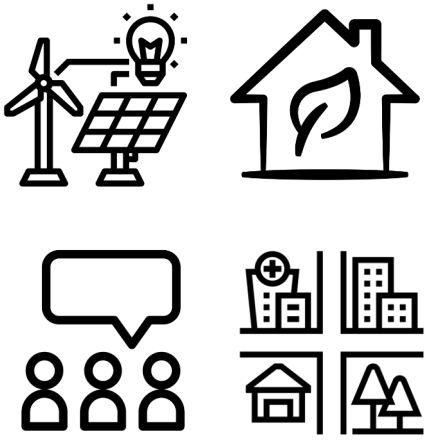
By trapping heat in the atmosphere and the ocean, we are adding heat and energy to weather systems. Not only does this mean more extremely hot days and fewer days below freezing in most places but changes in the patterns of rainfall, drought, and storms. Some areas see more rain and snow, because warmer air can hold more moisture. Some areas see longer droughts and wildfires, because the rain fell somewhere else. When storms, such as hurricanes, have more energy, they have higher winds and more rain – causing much more destruction. These changes are generally called extreme weather.



August 2011, showing three times the average precipitation on the East coast (dark green), and no precipitation on the West coast (dark brown.)

https://www.climate.gov/maps-data/data-snapshots/start

What Do We Do About It?



Solutions to climate change fall into four general categories:

- Energy Shift – innovations that make energy without adding carbon dioxide and other pollution to the air.
- Energy Efficiency – designing products and systems to use less energy.
- Talk About It – making sure everyone is involved in solutions and planning.
- Adaptation – designing changes to places and systems to better support people and places threatened by extreme weather.

Images from the Noun Project: Energy by ArmOkay, Energy Efficiency by Gregor Cresnar, comments by Sarah, infrastructure by Eucalyp

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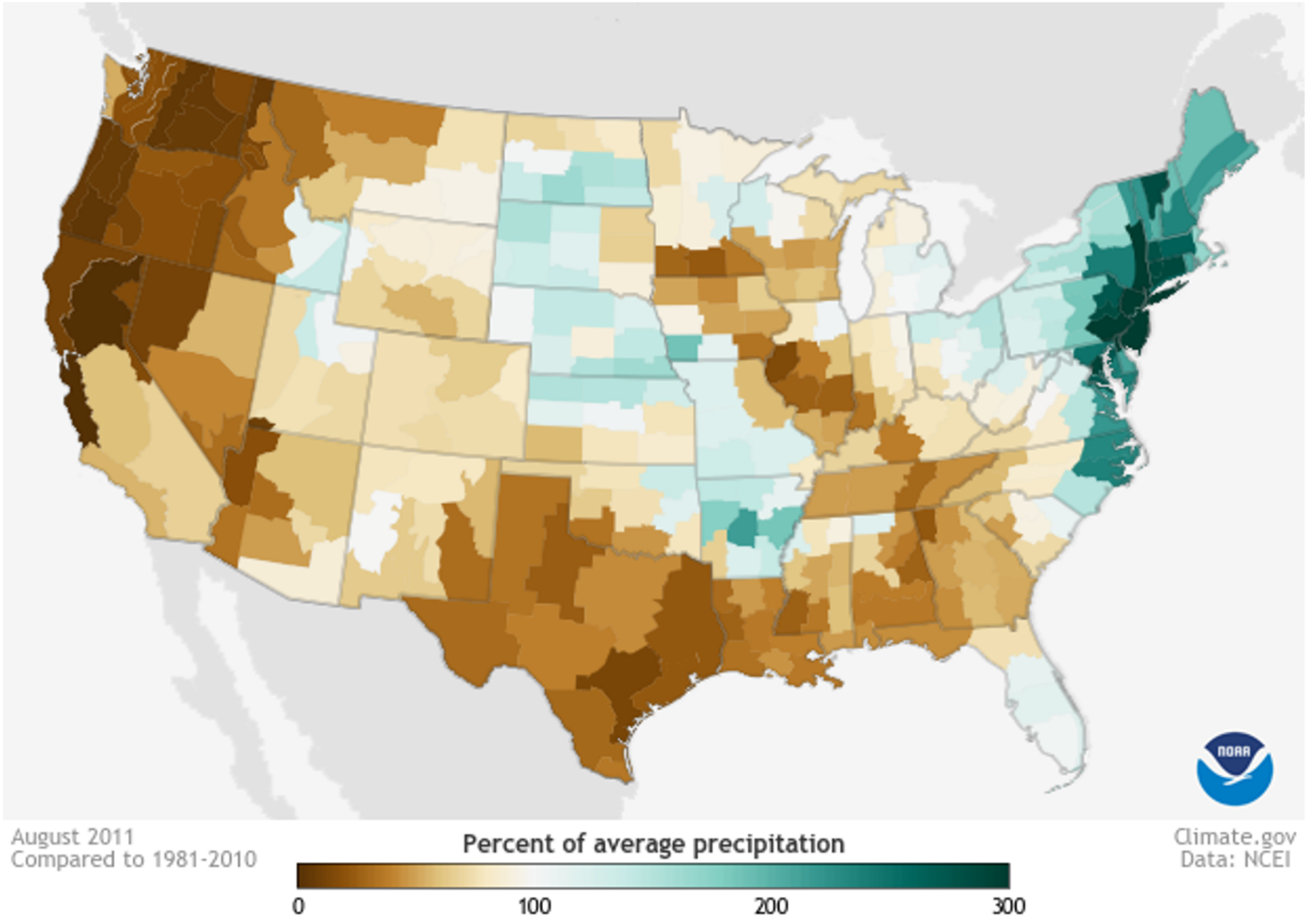


August 2011, showing
three times the average precipitation on the East coast (dark green),
and no precipitation on the West coast (dark brown.)

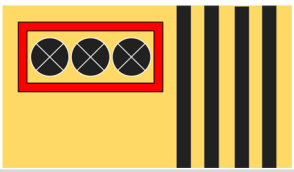
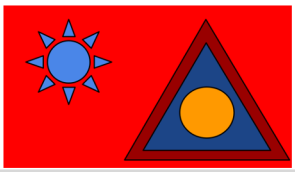
https://www.climate.gov/maps-data/data-snapshots/start

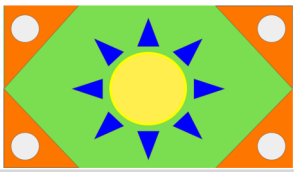
Today I Learned About National Security Natural Disasters and Mass Movement

"Pretty universally with climate change, it's recognized that there is a need for extensive planning, so that people can understand that they can't just peg everything to what they've experienced in the past."
Alice Hill, Council on Foreign Relations
TILclimate podcast: Today I Learned About National Security

The Past

Four neighboring imaginary countries share borders. All four countries trade with each other and give and receive aid in times of need. Their policies for trade, immigration, and aid were mainly established in the 1950s, with minor updates since then.
For each country, a dice roll will result in a different effect. The four countries and their results are below. Feel free to name the countries, if you wish. On the next page, follow the instructions to chart extreme weather experiences across the four countries during the 1950s. Then, answer the questions below.



Name				
●	Minor flood	Minor flood	Minor flood	Minor flood
●●	Average	Minor flood	Minor flood	Minor flood
●●	Average	Average	Minor flood	Major flood
●●	Average	Average	Average	Average
●●	Average	Average	Average	Average
●●	Minor drought	Average	Average	Minor drought

If you worked for an international aid organization, which countries would you be most concerned about? Why? How would you expect these countries to interact with each other?

dice by ladhina from the Noun Project

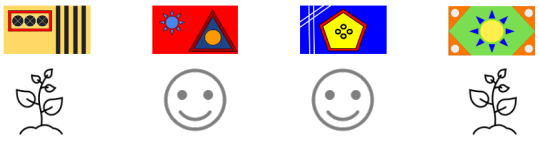
Today I Learned About National Security Natural Disasters and Mass Movement

Instructions

Roll one die.
On the chart, circle the effect for each country for that year. Use the same number for all four countries in that year.
Repeat ten times.
Return to page 3 and answer the questions.

Example

Year: 1959
Dice roll: 6



Major flood | Minor flood | Average | Minor drought | Major drought

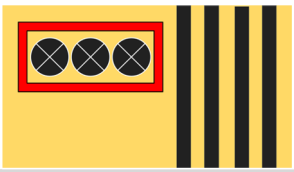
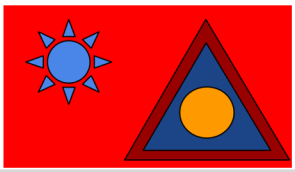
Year				
1950				
1951				
1952				
1953				
1954				
1955				
1956				
1957				
1958				
1959				

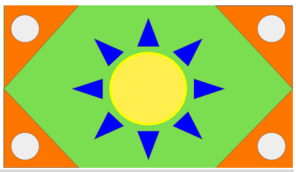
Today I Learned About National Security Natural Disasters and Mass Movement

The Future

The same neighboring countries are trying to plan for the year 2050 and beyond. As we burn fossil fuels like coal, oil, and natural gas, we release large amounts of carbon dioxide into the atmosphere. This carbon dioxide acts like a blanket, trapping heat. Trapped heat is warming our air and water, changing long-observed patterns in storms, drought, and other weather conditions. Many weather-related dice rolls will have a different result.

On the following page, follow the instructions to chart extreme weather predictions across the four countries during the 2050s. Then, answer the questions below.



Name				
●	Minor flood	Minor flood	Minor flood	Major flood
●●	Major flood	Major flood	Minor flood	Minor flood
●●	Average	Minor flood	Major flood	Major flood
●●	Average	Minor flood	Average	Minor flood
●●	Minor drought	Average	Average	Average
●●	Major drought	Average	Average	Major drought

What changes do you notice?

What would you expect these countries to do by 2050? How might their political and trade relationships change?

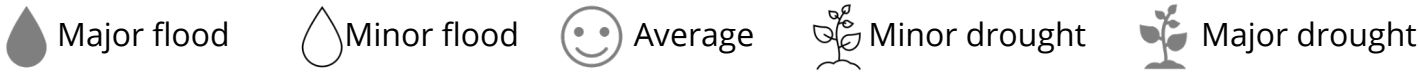
These predictions assume global carbon dioxide will stay the same or go up. Projects and programs all over the world are lowering the need to burn fossil fuels and produce carbon dioxide. Have you seen or heard about any projects or programs in your area? Discuss these within your group.

dice by ladhina from the Noun Project

Today I Learned About National Security Natural Disasters and Mass Movement

Instructions

Roll one die.
On the chart, circle the effect for each country for that year. Use the same number for all four countries in that year.
Repeat ten times.
At the bottom of the page, count the total number of **major** weather events for each country for each century.
Return to page 5 and answer the questions.



Year				
2050				
2051				
2052				
2053				
2054				
2055				
2056				
2057				
2058				
2059				

1950s total number of major weather events				
2050s total number of major weather events				

Today I Learned About National Security Adaptation and Planning

That's probably the most difficult lesson for anyone to learn because we've all grown up with the assumption that the future can be guided by the past.
Alice Hill, Council on Foreign Relations
TILclimate podcast: Today I Learned About National Security

A Warming Planet

As we burn fossil fuels like coal, oil, and natural gas, we add large amounts of carbon dioxide to the atmosphere. This carbon dioxide (along with other related gases) acts like a blanket, trapping heat. This trapped heat is causing big changes to the climate and weather around the world. We are seeing changes to patterns of precipitation and drought.

Local Impacts

Climate change doesn't look the same in all areas of the world, or even across the US Some areas are seeing more rain, while others are experiencing extreme drought.

1. Visit https://www.climate.gov/maps-data/data-snapshots/start
2. Click on **Precipitation** and then **30-yr averages by month: Precip.**
3. Choose one region of the US to focus on – perhaps your state and those around it, or a state where a friend or family member lives.
4. Along the bottom of the map, slide the **Month** slider to see average precipitation in inches throughout the year.

- Climate scientists establish averages over a 30-year period. Which 30-year period is this map based on?
- On average, what month has been the wettest for your chosen region? The driest?

5. Click on **Difference from Average – Monthly**
6. Along the bottom of the map, slide the **Month** slider to a month of your choice, then the **Year** slider to see that month's data for every year since 2000. Watch the same region you focused on above.

- What patterns do you notice in your chosen region?
- Are the patterns the same for other regions of the US? What do you notice?

Pay attention to regions that tend to be much wetter than usual, much drier than usual, or swing back and forth between extreme wetness and extreme dryness.

Today I Learned About National Security Adaptation and Planning

Local Impacts, cont'd

7. Click on **Drought** and then **Drought Monitor.**

8. Along the bottom of the map, slide the **Day** slider to the average driest time for your chosen region, then the **Year** slider to see that day's drought conditions for every year since 2010.

How often has your region been in drought conditions at the **driest** time of year?

9. Now slide the **Day** slider to the average wettest time for your chosen region, then the **Year** slider to see that day's drought conditions for every year since 2010.

How often has your region been in drought conditions at the **wettest** time of year?

10. Changes in precipitation can have huge impacts. Within one year, one region could have both flooding and water rationing, or a winter with no snow followed by a rainy summer. Think about the kinds of jobs and industries that might be affected by the weather in your chosen region.

Name three jobs or industries, and briefly describe how too much or too little water might be a problem for people doing that job.

11. Look back at the climate.gov Data Snapshot website.

What other questions could you investigate using this tool?

Today I Learned About National Security Adaptation and Planning

It's time we get busy and work hard to understand what the risks are and how we can shore them up and make sure that those choices at least are based on the latest science and what the threats are anticipated to be.

Alice Hill, Council on Foreign Relations

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Local Solutions

Communities across the United States are adapting to extreme weather. These projects help community members and leaders protect people and places from harm.

1.Visit https://toolkit.climate.gov/case-studies

2.Click **Filter by climate threat/stressor** and select either **Drought** or **Extreme Precipitation**.

3.Click on the pins on the map to bring up a short description of each case study. Choose one case study you find interesting and click its title to get the full article.

Briefly describe the problem these people were facing.

Outline the solution they designed.

Talking about climate change with friends and family can feel scary or overwhelming. Sharing stories of real-life solutions can help. How would you explain this story to a friend or family member?

Today I Learned About National Security Adaptation and Planning

Local Impacts, Local Solutions

To see changes in precipitation, you looked at annual and monthly data over just two decades. Climate scientists study weather data over decades, centuries, and millennia. This helps them understand and model the future of Earth's climate. Even in the two decades you looked at, however, each member of your group might have noticed different trends, patterns, and changes.

Each One, Teach One

Have each member of your group share a few key patterns they noticed in the Local Impacts activity. One member of your group should take notes.

Discuss:

- What patterns did you all notice?
- What was surprising?
- What other questions did you think of to investigate?

In the last exercise, each member of your group read about an adaptation project somewhere in the US. Have each member of your group share for one minute about their chosen project. As you teach each other about the projects you chose, note:

- What is similar among all the projects?
- Which projects are you most excited about?
- Which projects could you imagine in your own community?

Talk About It

How would you like to share your learning with your classmates, your friends, and/or your family? What questions do you think they might have? Practice talking in your group, using the following pointers:

- Listen first - ask the person you're talking to whether they have noticed any changes in the weather over their lifetime.
- Tell a story - instead of facts and graphs, tell a story about a community like yours and how it is adapting.
- It's OK not to know - you don't have to be a climate expert to talk about the climate. Share what you observed, and where you got the information from. Discuss with your friend or family member how you might find the answers to questions they (or you) have.

Today I Learned About National Security Global Climate Impacts & Solutions

So we need to have our scientists give the very best science to the intelligence agencies. And then you can use those tools to help engage in what they call scenario planning.

Alice Hill, Council on Foreign Relations

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A Warming Planet

As we burn fossil fuels like coal, oil, and natural gas, we release large amounts of carbon dioxide into the atmosphere. This carbon dioxide (along with other related gases) acts like a blanket, trapping heat. This trapped heat is causing dramatic changes to the climate and weather around the world, especially changing patterns of heat and precipitation.

Global Impacts

Just like across the US, the impacts of climate change are not the same around the globe. During any given month or year, some areas may be colder or wetter than average while most areas are hotter and drier. If this difference from average is significant, it is called an **anomaly.**

1.Visit https://www.ncdc.noaa.gov/sotc/global

2.By default, the website gives you the most recent Monthly Global Climate Report. You may use the **Year** and **Month** drop-down menus to change the report.

3.Read the report, paying particular attention to the graphs and maps. (Click to enlarge.)

Month and year chosen:

Which areas of the world experienced the strongest temperature anomalies (either colder or hotter than average)?

Which areas of the world experienced the strongest precipitation anomalies (either wetter or drier than average)?

For both temperature and precipitation, what *base period* is used? What does this mean?

Today I Learned About National Security
Global Climate Impacts & Solutions

If we address the problem up front, we can reduce the threats to us externally and have this not escalate into a conflict, but rather an area where we can enjoy global stability.

Alice Hill, Council on Foreign Relations

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Global Solutions

Communities across the world are adapting to extreme weather. The challenges and solutions look different depending on where you are. Leaders and groups all over the world are coming together to protect people and places from harm.

1. Visit https://www.ipcc.ch/site/assets/uploads/2018/02/ar5_wgII_spm_en.pdf
2. Scroll to Pages 21-25, **SPM.2 Table 1**
3. Choose a region of the world where you observed extreme temperature and/or precipitation anomalies.

Region chosen

4. Read the Key Risks, Adaptation Issues and Prospects, and Risk and Potential for Adaptation for your chosen region.

If you were advising a government or non-governmental organization (NGO) in your chosen region, which adaptation measures would you recommend? Why?

What other question(s) could you investigate using these tools?

How would you explain what you have learned to a friend or family member?