# CLIMATE CHANGE & COMMUNICABLE DISEASES
## LESSON PLAN

<table>
<thead>
<tr>
<th>TITLE</th>
<th>Climate Change and Communicable Diseases. Adapted from <a href="https://www.niehs.nih.gov/health/assets/docs_a_e/climate_change_and_human_health_lesson_plan_a_508.pdf">https://www.niehs.nih.gov/health/assets/docs_a_e/climate_change_and_human_health_lesson_plan_a_508.pdf</a></th>
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<tbody>
<tr>
<td>SUBJECT</td>
<td>Climate Change</td>
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<tr>
<td>AUTHOR</td>
<td>Karolyn Burns, The CLEO Institute</td>
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<td>GRADE LEVEL</td>
<td>Grades 9-12</td>
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<tr>
<td>DURATION</td>
<td>Two 60-minute sessions, one for research and one to produce the PSA, possible homework assignment</td>
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## FLORIDA STANDARDS


## OVERVIEW

Students will use current data on the range of vector-borne disease and NASA projections to make predictions about the risks to human health from ecological shifts brought about via climate change.

## OBJECTIVE

Students will be able to describe the meteorological and ecological variables that are affected by climate change, how these relate to vector-borne diseases ad impacts on human health. Students will write a PSA to instruct vulnerable communities on how to mitigate this health threat.

## MATERIALS

- IPCC climate reports, WHO Health and Climate report (included), student worksheets

## ACTIVITIES & PROCEDURES

First, elicit prior knowledge about communicable diseases. Have them fill in the chart on climatic changes and how they affect human health. What kinds of animals act as vectors? How will the populations, ranges, and behavior of those vectors change as global temperatures rise?

The student handout has a passage from the CDC on this topic, which can be read independently or as a class, found at https://www.cdc.gov/climateandhealth/effects/vectors.htm

Show the world map of changing climate
https://www.youtube.com/watch?v=gG0zHVUQcw0&feature=youtu.be

What changes will Florida experience? What will the climate resemble in the coming years? How might a more tropical climate influence disease burden?

For each reading section, assign 3-4 students per section and distribute copies of the assigned reading to each group member.
Either in class or as a homework assignment, ask students to complete their reading assignment and either individually or in their group complete one or more rows of the graphic organizer provided on page 13 to summarize the climate and health impacts and vulnerable population identified in their reading. Have students use the graphic organizer and Chapter 11 from Working Group II of the IPCC’s Fifth Assessment Report or chapter 5 of the United States Climate and Health Assessment in the student handout to make the connection between these changes and their human health effects. See the next page for an example.

### Flooding, Vector-borne disease and Human Health

What is the **climatic driver**, also called specific climate change, which is referenced by this data visualization?

What is/are the **environmental condition(s)** that arise in response to this specific climate change? These conditions can either create(s) or exacerbate(s) an environmental hazard. What is the environmental hazard being examined?

An **environmental hazard** is what will directly lead to a negative health outcome. Together, the environmental condition(s) and the hazard(s) comprise the **exposure pathway**.

What is/are the **health effect(s)** that might arise from exposure to the environmental hazard? Health outcomes refer to the specific impacts of the hazard on human health.

Students can remain in the same groups for the next part of the assignment, or they groups can be re-arranged as part of a jigsaw method. Assign the groups to research the following (can change topics as desired, these are chosen for relevance to Florida): Zika virus, Dengue fever, malaria, West Nile virus. Next, students are assigned a reading (provided) from international reports to develop knowledge of the known impacts of climate change on vector borne diseases. Students are prompted to consider relevant vulnerable populations. They should use the worksheet provided to take notes on causes and effects, both the ultimate and proximate causes. For each impact, devise an idea to adapt and prevent human illness.

In their groups, students will create a PSA, poster, presentation, or brochure that describes both the problem, the causes behind human health hazards, and how to mitigate or adapt to them both with individual action and as a community using claim-evidence-reasoning framework.

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<thead>
<tr>
<th>Definition</th>
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<tbody>
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<td>Heavy Precipitation</td>
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| Flooding |
| Stagnant, standing pools of water which create habitat for mosquito larvae |

| Increased incidence of mosquito transmitted diseases |

### Extensions & Accommodations

Students can send a letter or a version of their presentation to their local elected officials, as part of a lesson on formal letter-writing, local government, and/or civic engagement. They can also present their risk mitigation strategies to others in their community, such as their family, faith community, or town hall meetings.

### Conclusions

Students will use real-world data to evaluate risks to human health, link them to the proximate cause and the underlying climate-based cause, then use the information to inform both vulnerable communities and local governments as to how they can reduce these risks. The CER rubric provided can be used to assess the argument made in the final assignment.