



# Climate Change Engineering Design Challenges: Make it Local!

We know the power of using local examples to help your students get engaged with climate change. However, we also know that, especially this year, everyone is really busy. Here's a down-and-dirty guide to personalizing these activities for your students in 15 minutes. If you are a high school teacher, you can even have your students do this work for you.

## Rising Tides

<https://ncse.ngo/rising-tides>

Explore: Ocean or River?

Climate change will have an impact on oceans and rivers, but the impact will be different. While oceans will see steady rise over time, rivers will be more prone to flooding (or, alternatively, more pronounced drought, but that's outside of the scope of Rising Tides). You can show your students specific models here:

Oceans:

[https://ss2.climatecentral.org/#12/37.7567/-122.4268?show=satellite&projections=0-K14\\_RCP85-SLR&level=6&unit=feet&pois=hide](https://ss2.climatecentral.org/#12/37.7567/-122.4268?show=satellite&projections=0-K14_RCP85-SLR&level=6&unit=feet&pois=hide)

Rivers:

[www.floodfactor.com](http://www.floodfactor.com)

Based on the model, you can set up either an ocean or river ecosystem and encourage your students to protect their particular environment.

## Cool Cities

<https://ncse.ngo/cool-cities>

Explore: Geographic Constraints

Teaching in a pandemic means that each student will likely not have the same materials to constrain their design. That means providing what we anticipate teachers providing in an open-world sandbox structure to build, play and test. While this can be incredibly effective,

adding just a few geographic constraints can really personalize the experience. Suggestions include:

- 1) Having any large roads or bodies of water
- 2) Limiting types of construction materials
- 3) Setting a population (or proportional population)

### Extend: Climate Equity

A huge part of empowering students to solve the climate change crisis involves developing solutions that address climate change inequity. Right now, more vulnerable populations are more likely to 1) have great exposure to climate change hazards, 2) suffer greater susceptibility to climate change hazards, and 3) be less able to recover from suffering these hazards. Once your students have explored the basics behind keeping a city cool, invite them to explore ways to extend those solutions to everyone. Try to focus on one example so that your students can explore multiple dimensions of the problem without being overwhelmed. Some suggestions for structuring their thought include:

- 1) How do we fit more people inside a single block while still keeping the city cool? Are there innovative designs that allow for dense populations while keeping people cool and giving them privacy?
- 2) Does income determine where someone lives in your city? If so, then what does that say about their risk for exposure to climate disasters?
- 3) Are typical “individual choice” solutions (e.g., community gardens, bike lanes) to climate change equally available across your city? If not, what changes could be made to increase this?