

Documentation

Description

According to the Intergovernmental Panel on Climate Change, the amount of sea level rise between 1993 and 2010 was almost twice that of the entire previous century. And the World Economic Forum Opens in new window estimates that vast numbers of people are already experiencing the effects of sea level rise, including 70 percent of Europe's largest cities, the 19 cities in Africa with 1 million or more residents, and the 78 million residents of low-elevation cities in China. If sea levels continue to rise at this rate or faster, hundreds of millions of people will be affected by the year 2050. For example, just a 0.5-meter change in sea level—lower than current projections—would result in more than 10 percent of land being lost in Bangladesh and as many as 15 million people being displaced.

Coastal inundation due to sea level rise affects not only global communities but also local and global economies. If countries, cities, and businesses do not act to protect themselves and become resilient to sea level rise and other climate-related hazards, vulnerable infrastructure, such as energy plants, water treatment facilities, underground communications cables, and transportation networks like ports and railways, could be damaged, causing widespread disruption both locally and globally. By modeling sea level rise, communities and organizations can identify infrastructure that will be affected by coastal inundation and make informed decisions.

Shared Socioeconomic Pathways (SSPs), or climate-change scenarios, use historical greenhouse gas emissions to model future emission projections. Five categories of SSP-based scenarios are used in climate models to visualize the possible effects of climate change on climate-related hazards, like sea level rise. The scenarios range from best-case to worst-case scenarios for adding greenhouse gas emissions into the atmosphere. The National Oceanic and Atmospheric Administration (NOAA) provides sea level rise data based on climate scenarios.

Scenario

The city of Miami Beach wants to visualize and analyze the future impact of sea level rise on its community.

Imagine that the city of Miami Beach wants to be proactive in its response to climate change. Analyze the potential impact of rising sea levels based on the intermediate-high climate scenario for the years 2030, 2050, and 2090 to help plan and design a resilient future for the city.

Technologies

ArcGIS Pro 3.3

ArcGIS Online

ArcGIS 3D Analyst extension

ArcGIS Instant App