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The effect of sea level rise on Felix Varela Senior High School, Miami, Florida, USA

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Problem Statement: How will Felix Varela Senior High School be affected by an increase in sea level as a result of global warming?

Abstract

South Florida is topographically flat with an elevation that ranges from sea level to about 25 feet and is therefore threatened by an increase in sea level rise as a result of global warming. Felix Varela Senior High is located in South Florida, and therefore will experience the effects of sea level rise. The effects of sea level rise will be gradual. To help visualize the gradual impact of sea level rise on Felix Varela Senior High, students created a series of Google Earth maps with different colored overlays with each indicating a 1-foot increase in sea level.

Global Warming

The world's average temperature has risen 1.4°F during the last 100 years, and most of it has occurred during the last few decades. Since 2000 the earth's temperature has increased by 0.25°F, which at first may not seem like a large amount, but it is a significant increase in the rate of warming when compared to the previous 100 years. This is disturbing. Even more alarming is that climate scientists expect the temperature of the earth to continue to increase during the next 100 years at a rate even higher than the last 100.

Although there are many consequences of global warming, one consequence is the rise of ocean water around the world. This increase in sea level is particularly worrisome to South Florida. All of Florida is relatively flat, but South Florida is especially flat with an elevation range of only 0

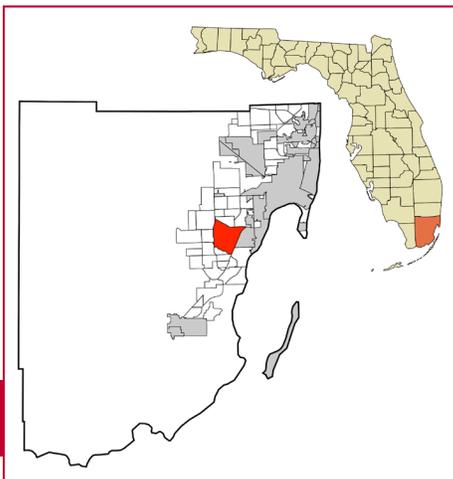


Felix Varela Senior High School, Miami, Florida, USA

feet to about 25 feet. Even a slight increase in sea level would be a problem for South Florida. Unfortunately for South Florida, it is expected that by 2100 sea level will rise between 3 and 6 feet. Even higher sea level rise could occur if the Greenland and West Antarctica ice sheets, which hold most of the earth's fresh water reserves, melt more quickly than originally thought. Some scientists are stating that recent satellite images are showing the ice sheets are indeed melting faster. It should be noted that sea level will increase not only as a result of ice caps and glaciers melting, but also because of the thermal expansion of water as it heats up.

Kendall, Florida

Felix Varela Senior High School is located in a suburb of Miami, Florida, in an unincorporated area called Kendall. Kendall is south-west of Miami and is near the Florida Everglades. As of the last government census in 2000, there are about 75,000 people living in the Kendall area. There are several communities that comprise Kendall: The Hammocks, Country Walk, The Crossings, Kendale Lakes, Kendall West, and Three Lakes. Kendall is a growing suburb and popular with young families just starting out. Below is a map showing the location of Miami, and the location of Kendall as it relates to the city of Miami.



Map of Kendall from Wikimedia commons

Felix Varela Senior High School

Felix Varela Senior High School (Varela) is located in the Hammocks community of Kendall. It opened in 2000 with just over 3000 students. The local area kept growing and therefore more students kept enrolling in the school. At its highest, the student population reached up to 5000 students and had to run its school day in two shifts to accommodate all the students. However, other high schools were built so the population of Varela has decreased and is now maintained at about 3000 students.

At first glance Varela appears to be a typical American high school, but it has some extra added features which makes it rather unique. Varela has 3 magnet programs: Veterinary Science which prepares students for careers in the veterinary assisting industry, Global Studies which teaches students the complex issues confronting today's globalized societies, and iP-REP which allows students to participate in rigorous college level courses using innovative technologies. Additionally, Varela has five academies which focus on a specific major to help students graduate with a strong foundation in a subject they will want to pursue as a career. The academy majors are Health Science, Information Technology, Performing Arts, Visual Arts, and Communications. Together, these unique aspects of Varela help make it to be recognized as an "A" rated school in Florida.

Varela's campus consists of 3 main buildings. There is a main office building, a 2-story primary building has most of the school's classrooms, and a large single story building that houses more classrooms, but also the school's gym and 2-story auditorium. There are two other smaller classroom buildings, which are called the "concretables." Two patio areas, one covered and one open, are available for students to

Varela with a 5-Foot Sea Level Rise



With sea level rising to 5 feet, the entire track field will be flooded along with oval-shaped parts of the old drivers education lot.

Varela with a 6-Foot Sea Level Rise



With an increase to 6 feet, the rest of the drivers education lot will be flooded, as well as the parking lot and border areas of the sports fields. Interior areas of the physical education will also be affected.

Varela with a 7-Foot Sea Level Rise



At 7 feet, the rest of the physical education fields and parking lot will be underwater. Alarmingly, so will be the area that houses the animals in the veterinary area.

Varela with a 8-Foot Sea Level Rise



An 8 foot level increase in sea level is very disturbing as now almost all the school is feeling the effect. All the patios and walkways are flooded and well as the lower floors of the classrooms.

Varela with a 9-Foot Sea Level Rise



At 9 feet all classes are underwater and some water will now be moving upward to the higher floors. Only a small area in the southeast corner has not been affected by sea level rise.

Varela with a 10-Foot Sea Level Rise



At an increase of 10 feet in sea level, the entire school will be inundated with ocean water.

The effect of global warming in Varela is evident in the series of photos. Because of its low elevation all of the school will eventually be underwater. The flooding will be gradual, not in large increments as implied by the images above. Rather, as sea level rises the lowest areas will at first feel the effects by being slow to drain after a rainstorm. As the years go by, the water will become permanent and never really drain completely. Slowly, the water will begin to fill-in the next low lying areas until by the year 2100 all of South Florida will be underwater, along with Felix Varela Senior High.

References

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