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IDH 1041 Honors Core 2

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The Rising Tides of Florida and How to Slow Them

Executive Summary

Since 1900, the global average sea level has risen by about 7–8 inches. It is projected to rise another 1–8 feet, with a likely range of 1–4 feet, by 2100 as a result of both past and future emissions from human activities. Within Florida, this is an issue that is exasperated by hurricane landfall and constant thunderstorms. These events can damage infrastructure, cause road closures, and overwhelm storm drains. A rise in sea level presents major challenges to Florida's existing coastal water management system and can cause loss of homes, jobs, and lands, impacting the economic health of Florida. This executive summary aims to find solutions and proactive measures to protect Florida and make it more resilient. Within our data, the risk is defined as the chance of sustaining a substantial loss, the probability is defined as the likelihood of the hazard happening, and magnitude is defined as the major economic and social consequences of the climate hazard.

Sea level rise is a high-risk issue for all Floridians, and here we have outlined the likelihood of sea level rising and its widespread effects. The risks that come with rising sea levels are shown in *Figure 1*. The higher the probability of occurrence and the magnitude of consequences, the greater the risk to the community.

Probability of Occurrence (PO) and Magnitude of Consequences

		Low MC	Medium MC	High MC
High PO	New regulations and projects will be implemented to counteract the rise of the sea level.	Salt from the ocean affects freshwater habitats causing damage to entire ecosystems.	Flooding and hurricanes will be more common and stronger.	
Medium PO	Drinking water will become contaminated by saltwater and will need filtering before drinking.	Businesses based in susceptible locations would be in danger of closing or relocating which would harm the economy.	Entire or part of towns could become submerged in water	
Low PO	Biodiversity may increase as people who live on the coast might be forced to leave and fishing would decrease.	Owners of property near the coast might see their property value decrease. Would be more harmful to poor families as if they sell they may not be able to afford a new home.	If no preparations are taken people and other life could die.	

Figure 1: This table shows the probability of this threat (sea level rise) and the magnitude of consequences associated with its occurrence. The probability and magnitude of consequences are measured in terms of high, medium, and low. The highest risks occur when both the probability and magnitude of consequences are high.

Figure 2 shows our solutions to the sea-level rise problem at hand. They are to have all new buildings built along the coastlines to be built on stilts, create more storm drains and levees along the coast, and protect the sand dunes from man-made damage.

	Increases resilience?	Economically feasible?	Environmental impacts?	Implementable?
Build new coastal buildings on stilts to raise them in case of flooding	Yes. Building all new buildings on stilts helps to limit the damage that is caused by floods. This builds resilience, because the coastal town is taking the initiative to think ahead of the disaster by elevating the buildings.	Maybe. Adding stilts to building adds cost to the overall construction. If a budget is tight, there could be some issues coming up with the money needed to add stilts.	No harm. If a building or other infrastructure has been approved to be built in a specific area, it means it has already passed the necessary inspections. Meaning the building materials, land where the infrastructure will be built, and anything else needing to be approved, will have already passed inspection.	Yes. Other than a potential cost issue, building new coastal buildings on stilts is very implementable. There is really nothing that prevents building inspection quality stilts from being able to be added to buildings that have already been approved to be built.
Create more storm drains and levees along the coast	Yes. Building more storm drains and levees along the coast helps to collect any water caused by a flood before it can affect the town itself. The better these are built, the more water they can hold which means less would impact the town. This builds resilience, because the coastal town is taking the initiative to think ahead of the disaster by creating storm drains and levees along the coast.	Maybe. Depending on the budget of the coastal towns, building more storm drains and levees along the coast could financially impact them negatively. It may seem like a lot of money to build these, but it will cost less than it would to repair the town's infrastructure after a large flood, making the money spent worth it.	Maybe. To create more storm drains and levees, more undeveloped land will have to be dug up. This could cause trees and other wildlife to have to be removed.	Yes. Other than potential cost and land approval issue, creating more storm drains and levees along the coast is very implementable. Even though some wildlife may have to be removed or relocated, creating more storm drains and levees along the coast would not be hard to do. The hardest part would be getting the needed permission to make it happen.
Protecting sand dunes from man-made damage so they can stay larger to block as much storm surge as possible	Yes. Protecting sand dunes from man-made damage helps to keep them larger in size. The bigger they are, the more water from storm surges that can be blocked from flooding coastal areas. This builds resilience, because the coastal town is taking the initiative to think ahead of the disaster by creating storm drains and levees along the coast.	Yes. There is no cost to keeping the sand dunes safe. All people would have to do is follow the signs to stay off the dunes, which costs nothing for people to do. If everyone were to stay off of them, then the dunes would be able to stay bigger.	No harm. Keeping the dunes safe from man-made damage would actually benefit the environment. Dunes do not only act as barriers from water for the town, they also act as home for many types of animals that live on the beaches. Many times there are turtles or crabs that live in the dunes. If there are people walking on them or causing them damage in another way, this not only harms the dunes but the animals as well.	Yes. Protecting sand dunes from man-made damage is very implementable. There needs to be rules that are actually enforced put into place for those who decide to damage the sand dunes. If this is done, people will stay away from them, allowing them to stay bigger in size.

Figure 2: This table identifies three options for dealing with the threat of sea level rise and shows how reasonable and achievable they are. It includes four factors for consideration: resilience, economically feasible, environmental impacts, and how implementable it is. Our best option for dealing with this threat would be something like the option shown above, that answers yes to almost all of the factors.

If we employ these three solutions and increase awareness about sea-level rise and its adverse effects, we are able to build Florida's resilience against climate hazards and help mitigate the detrimental effects that are already impacting the state. We have economically feasible and effective options to help fight against inland flooding of rising sea levels that need only to be recognized state-wide and implemented by administrative and elected officials, in order to set an example for other states who face similar challenges. This is how we protect Florida from one of the many hazardous climate risks that our state faces each day, and to help protect the future of Florida.

Jobs: Ariauna – Overview, Jorge - fill out PO and MC table (please type out what info you're putting in the table and send it to Emily so she can put it in the table she made in word and make it look pretty), Gennessee - Grammar check, Alex - Label tables and captions, Maggie – Summary, Emily - fill out the solutions table and make both tables