

Sea Level Rise Adaptation Role-Play Game Design

(This version has been adapted for younger students)

Objective:

Players work together to develop a sea level rise plan for their community.

Goals:

(1) **For the researchers:** To introduce participants to the common (and uncommon) sea level rise adaptation strategies and opportunities. To discover what strategies players prefer in order to assess how participants see their community adapting to sea level rise.

(2) Might be good to have a goal for the educator/teacher.

(2) **For students:** To gain an understanding of the vast undertaking that planning for sea level rise will be with the coordination of different stakeholders and adaptation strategies given the reality of economic limitations. To become familiar with the different strategies available for sea level rise adaptation.

Duration:

30 minutes of game play, plus 10 minutes for post-evaluations and discussion.

Players:

5 players, plus 1 facilitator/observer per group

Setting the Scene (the next 20 years)

Whether you realize it the ocean is starting to have a larger effect on where you live. Have you heard about all the increased storm activity along the coast? It's common to see awful images of family's homes and cars flooded because of increased **storm surge**. Researchers know that the sea level is rising, the only thing they are not sure of is how much will it rise. Imagine if it were to rise 3 feet. Look at the maps on page __. Using your imagination and the images on the map imagine what the environment would look like if the sea were to rise 3 feet. Remember this isn't like a onetime deal where there's this huge flood and then it goes away. This is a slow rise of the sea level that will remain that way for a good portion of your life.

Do you think the area will look different? Do you think homes will be in the same place? Do you think oyster reefs will be in the same place? Do you think the saltmarsh will be in the same place? If not where do you think these things will be located? Or do you think they'll just disappear completely?

Well don't worry about your answers because researchers aren't too sure either. But that's why we need to start thinking about these things so that we can plan for them. Think of it like this...Imagine you ride the bus to school. The bus picks you up at your house around 6:45 AM (ugh soooo early). One day the bus driver tells you as you're getting off the bus that he is going to start picking you up 3 minutes earlier every morning for the rest of the school year. You would want to start planning your mornings in the future in order to prepare for the earlier pickup, right? Or you'd at least want to plan to get a ride to school so that you wouldn't have to wake up so early. It's all about the planning!

So here's the deal! All of you are at this table represent different groups of people:



Local Residents



Developers



Government Officials



Business Owners



Scientists

The whole table (your Community) has been given a total of \$800 million to put towards planning. Remember you represent one of the groups above. Each "group" (meaning you) has money to spend on planning for the sea level rising 3 feet. Put your group's mind-cap on. Think like your group, be your group. When it comes to planning for sea level rise and spending the money choose ways that will be best for your group.

Things to remember:

- The whole table has \$800 million and that's it
- As a table you have to plan for the next 20 years
- But you want your plans to last for ideally the next 100 years!!

Words to Know...

Storm surge: A rising of the sea as a result of atmospheric pressure changes and wind associated with a storm.

Biodiversity: The variety of life in the world or in a particular habitat or ecosystem.

Rules of the Game:

1. Take a seat and turn over your group card (which group do you represent)
2. Read the strategy cards on the table and look at the maps.
3. Think about what your “group” would like and why (in regards to sea level rise planning).
4. Begin with the “Local Resident” player and share what strategies you like (acting as your group) and talk about why you like these strategies. Take turns sharing your preferred strategies going around the table *Clockwise*. And it’s okay...players can like the same strategies.

Example: “I am a local resident. I like seawalls because they protect my house from floods.”
5. The game leader will let the groups know when there is 10 minutes left. At this point, groups should start making whole-table decisions on a set of strategies they would like to use for their community, while keeping in mind the table only has \$800 million to spend.
6. The game ends after 30 minutes of playing time. ***The goal is to have a strategy, or set of strategies that everyone can agree on but are also affordable by the end of the game.***
7. After the game ends, fill out the post-evaluation sheet as a group.
8. Pick one person from each table to share which strategies their table picked and what they thought about the game.

Materials:

- Stakeholder persona cards (“Group” identity cards)
- Strategy cards
- Map: Areas with 3 feet sea level rise
- Map: Conceptual map of strategies
- Timer (cellphone)
- Pens and small notepads
- Small calculators (cellphone)
- Group post-evaluation

Stakeholder personas (total funds = \$800 million):

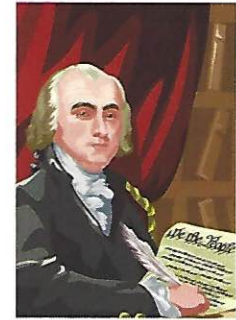
Local resident (\$100 million)

- You are selected to be the community rep on this issue.
- You live next to the beach.
- You and your neighbors like living next to the beach because you like seeing wildlife in your backyards, watching dolphins swim into the sunset, and relaxing on the beach.



Government official (\$350 million)

- You are a powerful local elected official.
- You have lived in this community for many years and plan to continue living here because you are a fisherman and you love the area.
- You have heard recent reports about the potential impact of sea level rise in your community but you find it hard to provide what is needed to plan for this issue because you are more worried about current issues, like stopping crime.



Ecotourism business owner (\$100 million)

- You have lived here your whole life and you own a kayaking tour company.
- Recent storms have caused some damage to your business and you are beginning to worry about more storms damaging your business again in the future.
- You know that development threatens to take over the marsh areas that you like to take some of your tours through and you are worried about butting heads with the developers.



Stakeholder personas (total funds = \$800 million):

Inland developer (\$150 million)

- You are not a full time local resident but you own a lot of land inland from the coast.
- You predict that as people begin to worry about sea level rise, they will want to move further inland. You would like to build a community to help this predicted demand.



Environmental scientist (\$100 million)

- You are not from Florida, but you came to live here because you like the awesome ecosystems and biodiversity of the area.
- You worry about the health of the local ecosystem, especially threatened species, with the pressures of development and now the threat of sea level rise.
- You are particularly interested in sea turtles and manatees.



Strategy Cards

Seawalls

- Physical barriers between the sea and land to prevent flooding of developed areas.
- \$4.24 million per mile
- Key benefits: Protect homes and other buildings



Beach nourishment

- Replacing sand lost to erosion to re-widen a beach.
- Lifespan: 5 years
- \$3 to \$15 per cubic meter, depending on dredge site; \$100 million for a large beach
- Key benefits: Protect homes and other buildings; keep beaches from washing away; protect recreation and tourism



Planned relocation

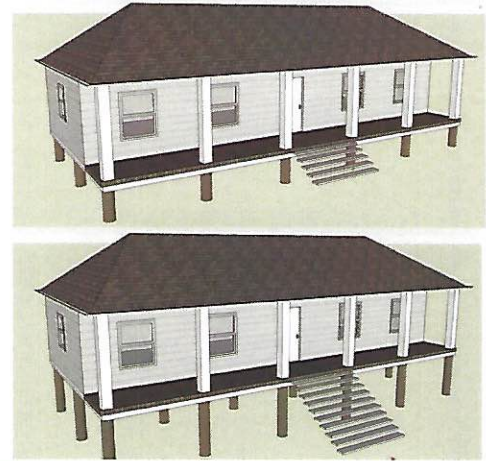
- Gradually moving development away from high-risk coastal areas. Land will be bought inland to allow for development to be rebuilt away from areas that are threatened by sea level rise.
- \$700 million over the next 20 years
- Key benefits: Protect future development; allow migration of wetlands and threatened species



Strategy Cards

Elevating structures

- Raise existing and future structures on stilts to protect them from storm surge and flooding.
- \$150,000 for 2300 sq. ft. building
- Key benefits: Protect homes and other buildings



Habitat migration corridors

- The government or non-profit agencies buy pieces of land to connect different wildlife habitats.
- Buying this land and not allowing it to be built on gives species a way to safely migrate from the coastal areas to inland areas.
- \$50,000 per acre
- Key benefits: Allow migration of wetlands and threatened species



Ecosystem conservation

- The government purchases relatively undeveloped land from coastal property owners and puts it into conservation so that no one can build on it.
- This conservation land protects habitats and makes shorelines safer by preventing development in areas threatened by sea level rise.
- \$50,000 per acre
- Key benefits: Protect private property rights; allow migration of threatened species



Strategy Cards

Living shoreline

- Putting wetlands in areas that have lost them or putting wetland plants in areas where they can easily grow. Wetlands act like a buffer between the sea and developed land.
- Other materials like wetland plants, sand, aquatic vegetation, oyster reefs and stone can be used to form protective shorelines and maintain habitat.
- \$25,000 per acre
- Key benefits: Allow migration of habitats and threatened species; protect recreation and tourism; protect fisheries and nesting grounds; improve water quality because wetland plants filter stormwater runoff



Conceptual strategy: Water storage easement

- Conservation easements of at least 10 acres on private lands to provide ecosystem services, mainly water storage.
- As sea levels rise, freshwater can become contaminated by saltwater.
- Water storage easements help protect the community's freshwater supply, while supporting ecosystem health and protecting land for habitat migration.
- \$50,000 per acre
- Key benefits: Support ecosystem services; protect freshwater supply

