11 Different Layers of Defense

In the wake of a major hurricane, the residents of the Louisiana Gulf Coast have at least 11 different natural and man-made strategies to help them. Yes – 11 different strategies! You cannot depend exclusively on one plan of attack, such as the building of levees. When you face a powerful hurricane, you must have many different plans to help you survive.

Do you know what the 11 different strategies are? Take the following quiz and you should be able to understand what each defense is and how it works to protect you.

1. The Offshore shelf. The Offshore Shelf is the shallow coastal region that ranges from zero depth at the shoreline to about 300 feet deep at the edge of the shelf. The width of the shelf varies from a few miles from the coast to hundreds of miles.
    A. The main benefit of the shelf is that it dramatically reduces the height and power of waves which have been whipped up from powerful winds. When waves encounter the edge of the shelf, they begin to slow down.
    B. The main benefit of the shelf is that it increases the height and power of waves. When waves encounter the edge of the shelf, they move faster.
2. Barrier islands, including the Chandeleur Islands and Grand Isle. They provide an important wave barrier and they reduce storm surge further inland.
    A. The barrier islands have been battered by several hurricanes in the last decade and their recovery has been slow.
    B. The barrier islands perform well during the first stages of a hurricane, but become useless after a while.
3. The Sounds. A sound is a long, relatively wide body of water, larger than a strait or a channel, connecting larger bodies of water. The primary benefit of a sound is to provide a shallow water buffer to deep water currents.
    A. Even though sounds are shallow, a really strong wind can create a large wave in a sound.
    B. Sounds prevent large waves from being formed because they are shallow and waves don't get a change to build up.
4. Marsh land bridge - A neck of land that connects two landmasses; an isthmus. They are the first pieces of land that form the coast.
    A. Landbridges are not effective because they are fragile themselves and require restoration and maintenance.
    B. Landbridges impede storm surges inland and protect other marshes behind them that will perform the same function.
5. Natural ridges. Located further inland, they are the natural levees of abandoned tributary channels such as bayous, streams and rivers. They are most effective when they are elevated six feet and have well drained soil.
    A. Natural ridges disrupt the flow of water because water no longer has a straight path. It has to move up and down with the ridges.
    B. Natural ridges aren't elevated enough to keep water away and therefore they are ineffective.

6. Manmade soil foundations – or highways, railroad tracks and similar ridges. Many run parallel to the coast and can be several feet in height.
    A. Highways and railroad tracks are elevated but not high enough to prevent much water from moving forward.
    B. Highways and railroad tracks are elevated enough to provide a "bump" that slows down some water.
7. Floodgates. They generally are left open so they don't impede navigation or the natural ebb and flow of tides.
    A. Floodgates are closed during a threat of flooding and they reduce flood tides in channels.
    B. Floodgates are ineffective because the coast already is low and water can move easily around floodgates.
8. Levees – they usually are defined as the "absolute" barrier because they stop the progress of water. On one side is ground that is flooded and on the other is a protected side.
    A. Levees are ineffective because they protect small portions of the coast, generally cities where there is intense economic development.
    B. Levees generally have worked quite well. For example, the Mississippi River has levees on both of its sides and they have kept the river in check for decades.
9. Pump stations. They "displace" or remove water, usually from within an area that has been walled off by levees.
    A. Pump stations are not effective because they were not designed to pump out flood water. They were made to pump out rain water.
    B. It doesn't make any difference what kind of water they pump out. Pump stations are very effective at getting rid of unwanted water that has collected where it shouldn't.
10. Elevated houses – they are the last line of defense for immovable objects. Elevation means they are raised to a height that should keep them safe from flooding.
    A. Elevated homes and businesses are bad ideas because it's expensive to raise them higher.
    B. Elevated homes and businesses are more likely to survive the ravages of hurricanes such as Katrina and Rita, and they provide important side benefits such as improved protection from termites.
11. Evacuation – the last line of defense for people. They are highways, railroads or air transportation used to leave. Evacuation routes are selected based on their capacity to move large number of people to safer areas as a storm approaches.
    A. They don't work because some people just don't want to leave.
    B. They not only help get people out of harm's way effectively, but they also provide a route for first-responders.

Answers:

1. A
2. A

3. B
4. B
5. A
6. B
7. A
8. B
9. B
10. B
11. B