**Module 8 Assessment:**

1. **Introductory Reading: Student Responses:**

Students make lists of:

* Orrin Pilkey’s points regarding *not* rebuilding in place after a storm (in reference to Hurricane Sandy)
* Considerations of a homeowner deciding whether to rebuild after Sandy
* Future considerations of planning authorities in the next 20 years in a coastal city impacted by storm surge

Rubric:

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| **Points** | **List of Pilkey’s points** | **Homeowner’s considerations** | **Planning Authority’s future considerations for community resilience** |
| 4  | Thorough: > 5 items listed; includes details | Thorough: > 5 items listed; includes details | Thorough: > 5 items listed; includes details |
| 3 | Complete: 5 items with few details | Complete: 5 items with few details | Complete: 5 items with few details |
| 2 | Minimal: 3+ items listed | Minimal: 3+ items listed | Minimal: 3+ items listed |
| 1 | Incomplete: 1-3 items | Incomplete: 1-3 items | Incomplete: 1-3 items |
| 0 | No answer  | No answer | No answer |

1. **What is Managed Retreat?**
	1. After reading sources on Managed Retreat, students identify the main components of managed retreat and differentiate between managed retreat and incentivized relocation after a coastal flooding event.
* *What are the most important conditions that must be in place in order to make managed retreat as defined here feasible?*
* *How does managed retreat as defined in this source differ from providing monetary incentives to homeowners to relocate to safer places further from the shoreline after a devastating storm?*

Rub*r*ic:

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| **Points** | **Conditions for managed retreat** | **Comparison between managed retreat and relocating after a disaster** |
| 4 | Thorough > 6 items listed with details | Thorough answer with good points that demonstrate understanding that the two approaches are widely different.  |
| 3 | Complete: 6 items listed; few details | Answer covers main difference, but lacks detail. |
| 2 | Minimal: 3–5 items listed; no detail | Answer is brief and misses main points, but has some merit. |
| 1 | Incomplete: 1–3 items listed; no detail | Answer is incomplete and misses most of the difference between the two approaches. |
| 0 | No answer | No answer |

1. **Examples of Managed Retreat:**

**California Coast:**

1. Students identify conflicts and obstacles to managed retreat in the example

Rubric:

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| **Points** | **Identify potential conflicts and obstacles to managed retreat in the example** |
| 4 | Outline demonstrates the complex political issues that may arise related to relocation of houses and businesses; complex, long-term and expensive management; temporary solution to ongoing sea-level rise  |
| 3 | Focuses on one or two of the above points; lacks explanation |
| 2 | Mentions on or two obstacles; no detail |
| 1 | One point only; no detail |
| 0 | No answer |

1. Google Earth Observations of California Example (Ventura Beach)

Rubric:

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| **Points** | **Observation notes of Managed Retreat location in Ventura Beach** |
| 4 | Thoughtful notes with detail that demonstrates a thorough observation using timeline feature |
| 3 | Notes demonstrate that student made complete observations |
| 2 | Notes show student “visited” site, but detail is lacking; no timeline information |
| 1 | Brief notes; not demonstration that observations were made using timeline |
| 0 | No answer |

**Student Activity:**

1. **Sorting out the Pros and Cons of Managed Retreat**

Rubrics:

* 1. Pros and cons

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| **Points** | **Managed Retreat** | **Hold the Line – Traditional engineering methods** |
| 4 | Lists at least 5 pros and cons with thoughtful detail | Lists at least 5 pros and cons with thoughtful detail |
| 3 | Lists 3–5 pros and cons each; little detail | Lists 3–5 pros and cons each; little detail |
| 2 | Lists 2–3 pros and cons each; no detail | Lists 2–3 pros and cons each; no detail |
| 1 | Lists 1–2 pros and cons each; no detail | Lists 1–2 pros and cons each; no detail |
| 0 | No answer | No answer |

* 1. The essential elements that allow for managed retreat (comparing U.S. and U.K. examples)

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| --- | --- | --- |
| **Points** | **Essential elements of U.S.-managed retreat examples**  | **Essential elements of U.K.-managed retreat examples**  |
| 4 | Provides more than 5 points covering all main elements, with detail | Provides more than 5 points covering all main elements, with detail |
| 1 | Provides 3–5 points, covering several elements. | Provides 3–5 points, covering several elements. |
| 3 | Provides 2–3 points; misses some main elements | Provides 2–3 points; misses some main elements |
| 2 | Provides 1–2 points; misses important elements | Provides 1–2 points; misses important elements |
| 1 | Brief answer with only 1–2 points; misses most elements | Brief answer with only 1–2 points; misses most elements |
| 0 | No answer | No answer |

* 1. Your conclusion:

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| **Points** | **Write a concluding paragraph based on the facts you have gathered in the above tables to explain which method of coastal management – traditional use of structures to “hold the line”, or managed retreat, you think will prevail fifty years from now.** |
| 4 | A thoughtful conclusion, incorporates most of the essential elements and factors listed in the previous exercises. |
| 3 | Concluding paragraph that includes many elements listed previously; missing some major points. |
| 2 | Concluding paragraph includes some of the elements and points made previously, but many important points are missing |
| 1 | Brief conclusion, missing most important points. |
| 0 | No answer. |

1. **Managed Retreat as response to disaster: Hurricane Sandy Recovery: Staten Island’s Fox Beach community**.

**Students write responses to the New York buyout program following Hurricane Sandy**

Rubric:

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| **Points** | * **In the New York example, what parameters make a property likely to be included in the buyout program?**
* **What general criteria must be met to allow for the success of this kind of program?**
* **Would the program work in all places? Why or why not?**
* **Give an example of a situation where it may not work or has not worked well to your knowledge.**
 |
| 4 | A thorough, thoughtful response to all of the points listed above. |
| 3 | Response covers all points listed above, but some details are lacking. |
| 2 | An incomplete response, with some of the listed points unaddressed. |
| 1 | A minimal response; many points missing. |
| 0 | No answer. |

1. **Investigating a coastal community in Louisiana using Google Earth**
	1. **Calculating the slope of the Louisiana Coastline at Isle de Jean Charles:**

Rubric:

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| **Points** | **Plot the slope of the shoreline using the measurements from Google Earth.** |
| 4 | Plot is accurately drawn and slope calculated correctly; axes are labeled correctly; correct units are used. |
| 3 | Plot is accurate, slope is correct, but some labels and units are missing. |
| 2 | Plot is inaccurate, but most of the elements are complete; slope is calculated but inaccurately. |
| 1 | Plot is incomplete; slope is not calculated correctly. |
| 0 | No attempt is made to draw plot or calculate slope. |

* 1. **Modeling storm surge:**

Rubric:

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| **Points** | **Using 1-D Model to find out how wind velocity values affect the storm surge level.** |
| 4 | All values obtained when using 1-D model are accurate. |
| 3 | More than 50% of the values obtained using the 1-D model are accurate. |
| 2 | Less than 50% of values obtained using the 1-D model are accurate. |
| 1 | Model was used and values recorded but inaccurately. |
| 0 | No values entered. |

1. **Reflection Question:**

Rubric:

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| **Points** | **The town of Isle de Jean Charles receives 6 m of water; what effects would the residents experience?** |
| 4 | A thoughtful reflection demonstrating that the student has gained a real understanding of what it is like to live in this type of landscape and what coastal flooding can be like for the residents. |
| 3 | Reflection demonstrates an understanding of the landscape and coastal hazards, but some ideas miss the point. |
| 2 | Reflection is short and misses a number of points, indicating that the student has not gained a good understanding of the situation. |
| 1 | Brief reflection with little thought or attention to details. |
| 0 | No reflection. |

1. **Compare Isle de Jean Charles to a nearby community to be protected by the “Morganza to the Gulf” hurricane protection levee**

Rubric:

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| **Points** | **Student uses Google Earth to make measurements of distance from the Gulf and calculate height of hypothetical storm surge for community of Dulac, to determine if a new levee will provide protection.** |
| 4 | The measurements are reasonable, and the student concludes that Dulac will be protected in the given scenario. |
| 3 | Measurements are not quite accurate and a false conclusion may result. |
| 2 | Measurements are inaccurate; student concludes Dulac will not be protected. |
| 1 | Incomplete work and inaccurate or invalid answer to the question. |
| 0 | No measurements or results. |

**Summative Assessment:**

**Student Activity:**

* Imagine you are a leader in coastal restoration, and you manage a limited budget to spend on this small part of the Louisiana coast. Outline the recommendations you would present to the Coastal Protection and Restoration Authority for protecting this community. Justify all of your points with facts from the above exercises.
* Imagine you are on a panel of scientists making recommendations to the community in a world in which budgets are tight and there are many competing needs for the resources available. Write a speech with recommendations for the future to be presented at a local public meeting at which the residents of Isle de Jean Charles will learn about the fate of their town.

Rubric:

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| **Points** | **As a local coastal zone leader with a limited budget, outline the recommendations you would present to the Coastal Protection and Restoration Authority for protecting Isle de Jean Charles. Justify all of your points with facts from the above exercises.** | **As a member of a panel of coastal scientists, write a speech with recommendations for the future to be presented at a local public meeting at which the residents of Isle de Jean Charles will learn about the fate of their town.** |
| 4 | Thorough: Detailed recommendations clearly demonstrate that the student has understood the multiple challenges currently facing coastal communities on a low-profile coast. Points take into account the costs of protecting coastal communities such as these. | Thorough: Detailed recommendations clearly demonstrate that the student has understood the multiple challenges currently facing coastal communities on a low-profile coast. Points take into account the costs and the tough personal decisions necessary when deciding the fate of residents. |
| 3 | Complete: Recommendations include many valuable points taken from the earlier exercises. Some details are lacking. | Complete: Recommendations include many valuable points taken from the earlier exercises. Some details are lacking. |
| 2 | Minimal: A short set of recommendations, lacking thought and detail. | Minimal: A short set of recommendations, lacking thought and detail. |
| 1 | Incomplete: Few recommendations; miss the main points from the module. | Incomplete: Few recommendations; miss the main points from the module. |
| 0 | No answer. | No answer. |