### Problem
The increasing rate of coastal erosion on Plum Island, Massachusetts has led to destruction of both the beach and the properties along the beach.

**Technical:** The jetties are in disrepair. Hard structures are causing destructive wave refraction.

**Economic:** Shoreline property is damaged. It causes decreased tourism which hurts local small businesses in the Newburyport area.

**Environmental:** Ecosystems harmed by construction

---

### Our Goal:
Develop a strategy to stop or reduce the destructive erosion on Plum Island.

---

#### Problems | Solutions | Description
--- | --- | ---
Destruction of the protective dune | Dunegrass/Sand nourishments | • Dunegrass keeps dune stable, providing buffer zone
• Best solution
• Needs maintenance

Intense storm wave forces | Biodegradable armoring | • Either geotubes or biodegradable sandbags
• Release sand when they break
• Should not refract wave forces

Shoreline construction | New build policies to prevent tragedy | • Should not construct in dangerous areas
• Give relief to families who loose home
• Minimize damage

---

### Recommendations
**Immediate**
1. Finish repairing jetties
2. Stop shoreline construction
3. Plant dunegrass

**Long term**
1. Maintain dunegrass growth
2. Build up storm defense
3. Maintain terminal groins
4. Formally study Plum Island’s storm intensity

---

### Solutions to Avoid:
Breakwaters, beach scraping, putting rocks on beach, hard structures that refract waves.

---

### References

---

### Research Plan
1. Identify the sources of the erosion on Plum Island through interviews with the Mayor of Newburyport and a local oceanographer.
2. Examine other cases of beach erosion to draw comparisons.
3. Develop a cost benefit analysis for solutions that can be implemented at Plum Island.