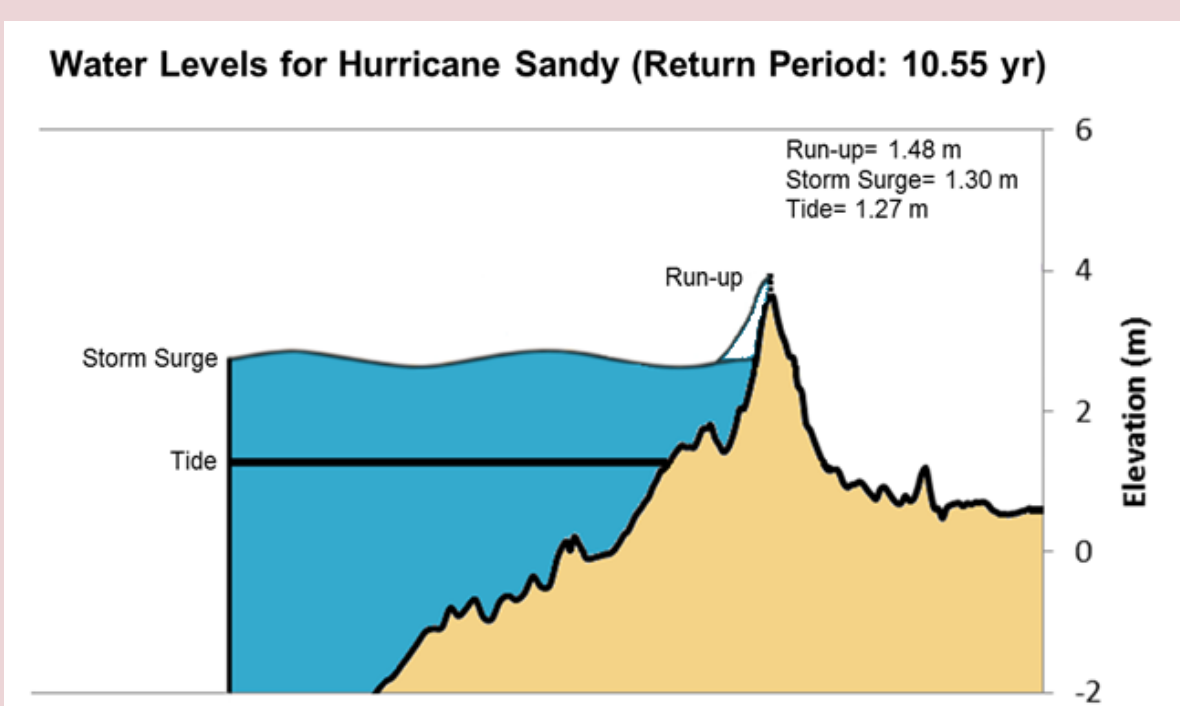
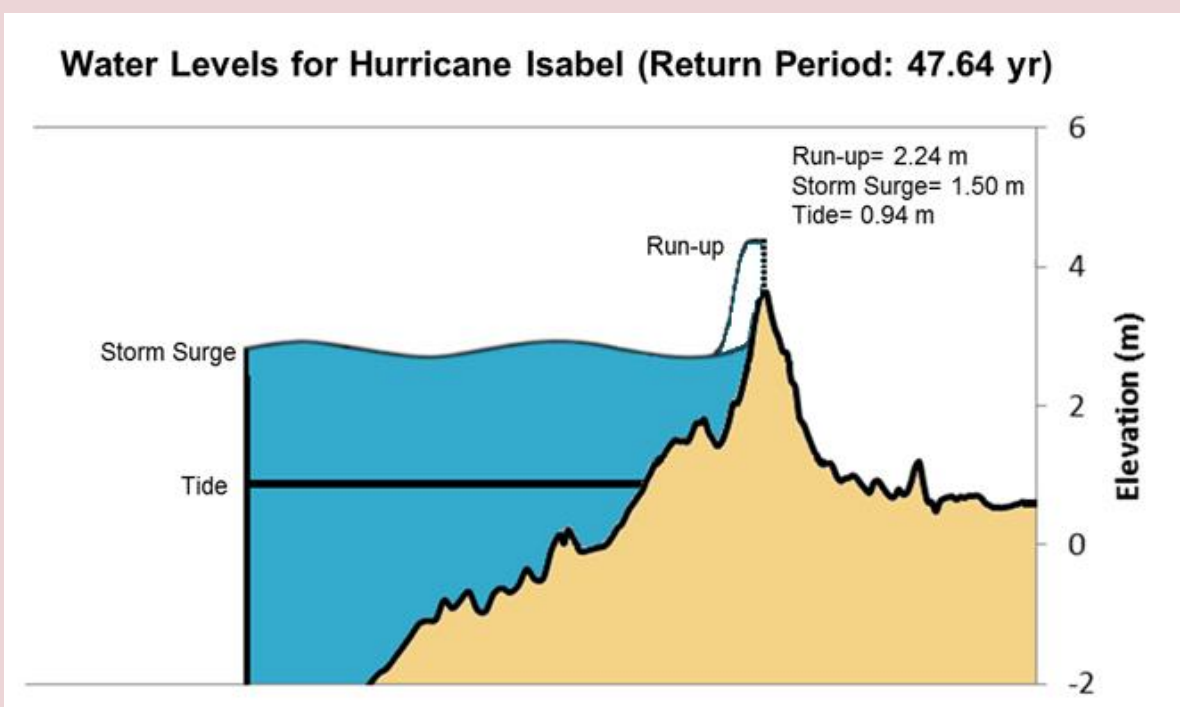


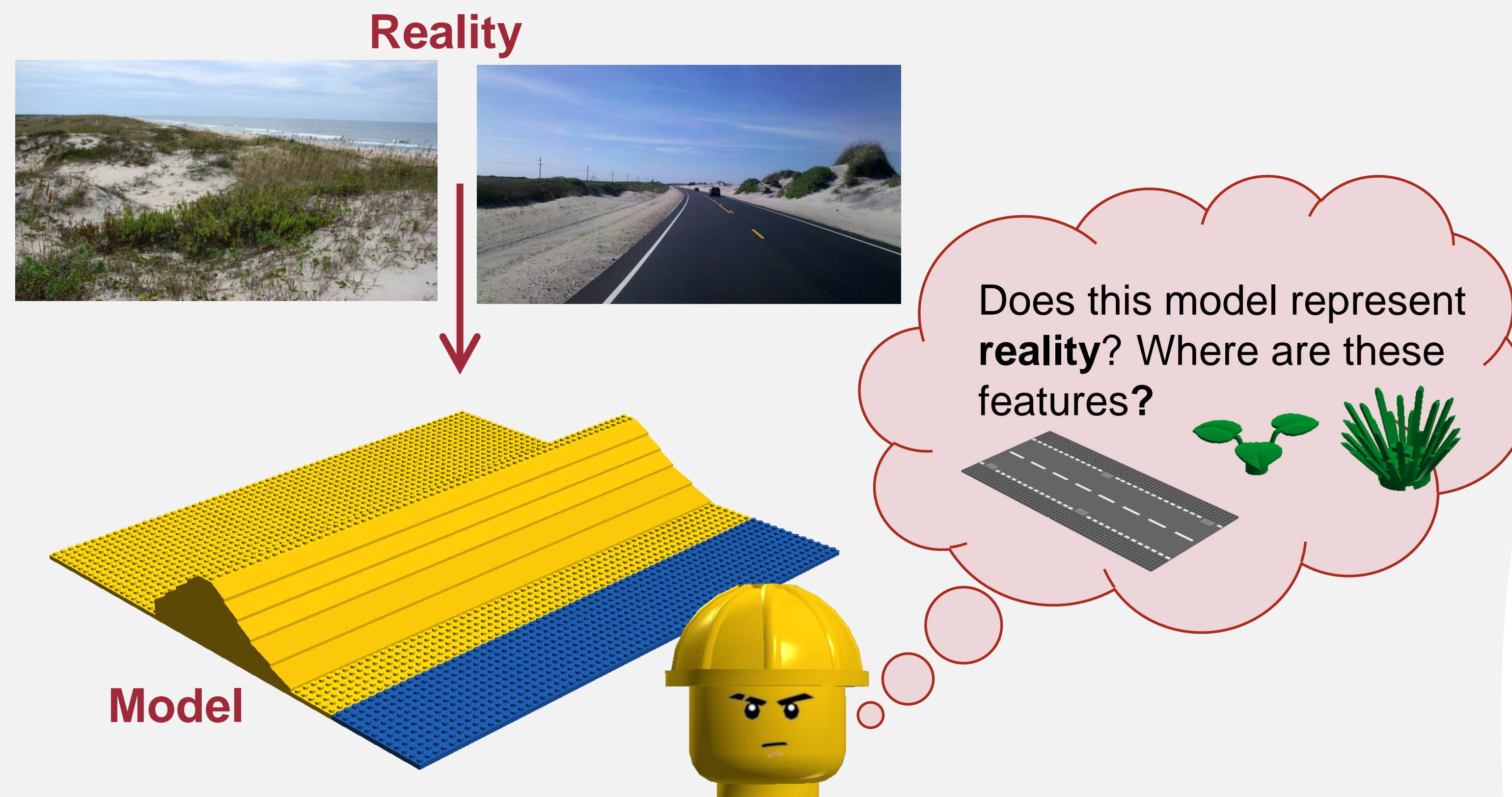
1. INTRODUCTION

Extreme events such as storms and hurricanes can cause **rapid** and far-reaching changes in coastal landforms such as **overwash**. Overwash has many implications varying from **short term** to **long term**. Roads can get covered **slowing down the recovery efforts**, ground floors of the houses can get **buried**, vegetation can be **lost** and the deposited sand can cause changes in habitat and ecosystem function evolution. **State-of-the-art** morphological models with high predictive capabilities are essential to **predict** landform response to storms; understand the risks; and make informed decisions.

2. STUDY AREA and STORMS



3. WHY INCLUDE LAND COVER?

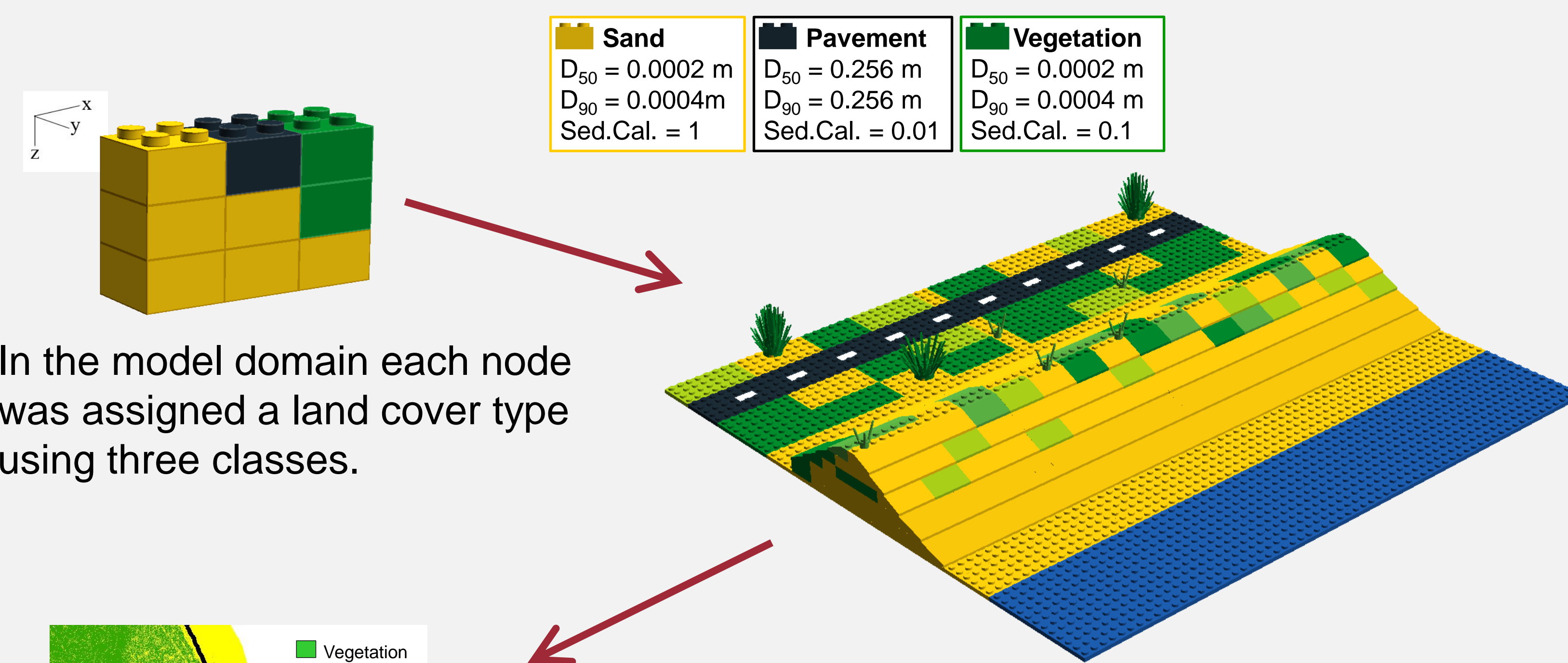


Land cover should be incorporated to enhance the **realism**. Modeling land cover improves modeled results when compared with **post storm data**.

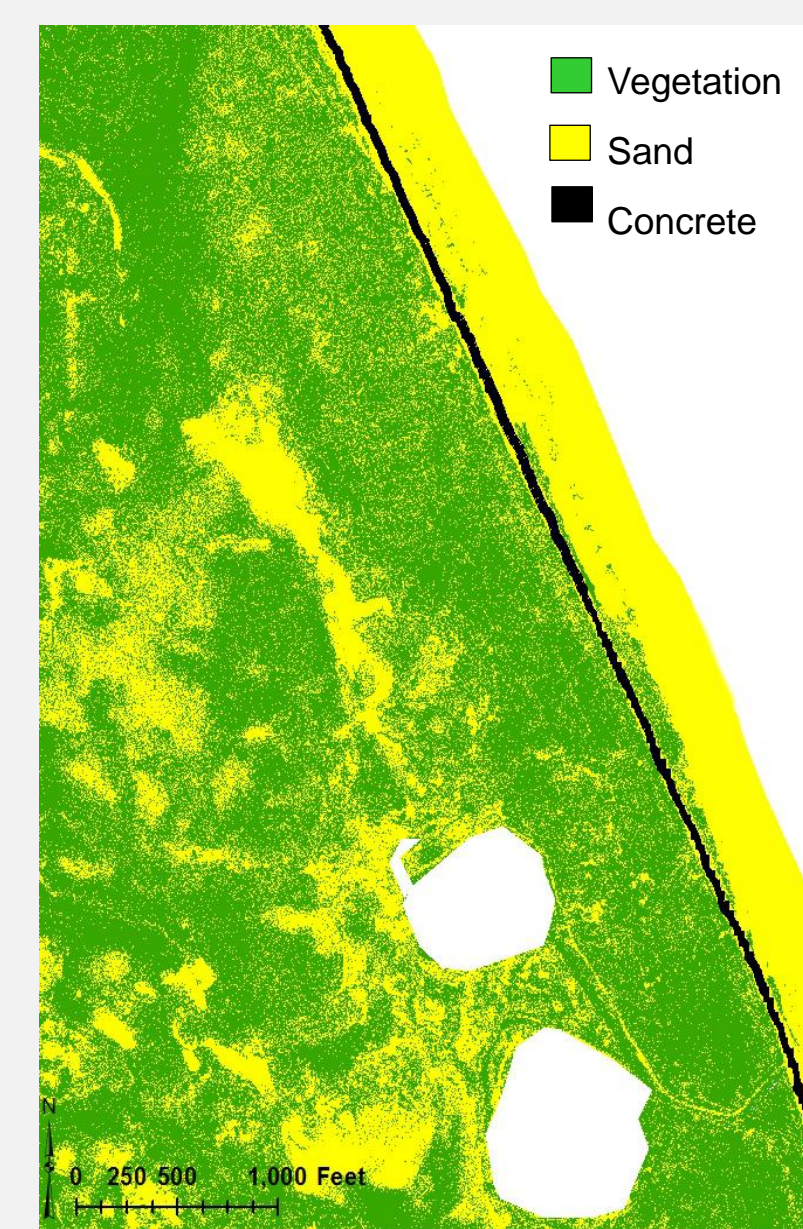


When dunes are destroyed and overwash fans develop, water flow and resulting deposition patterns are **directly related to land cover characteristics**.

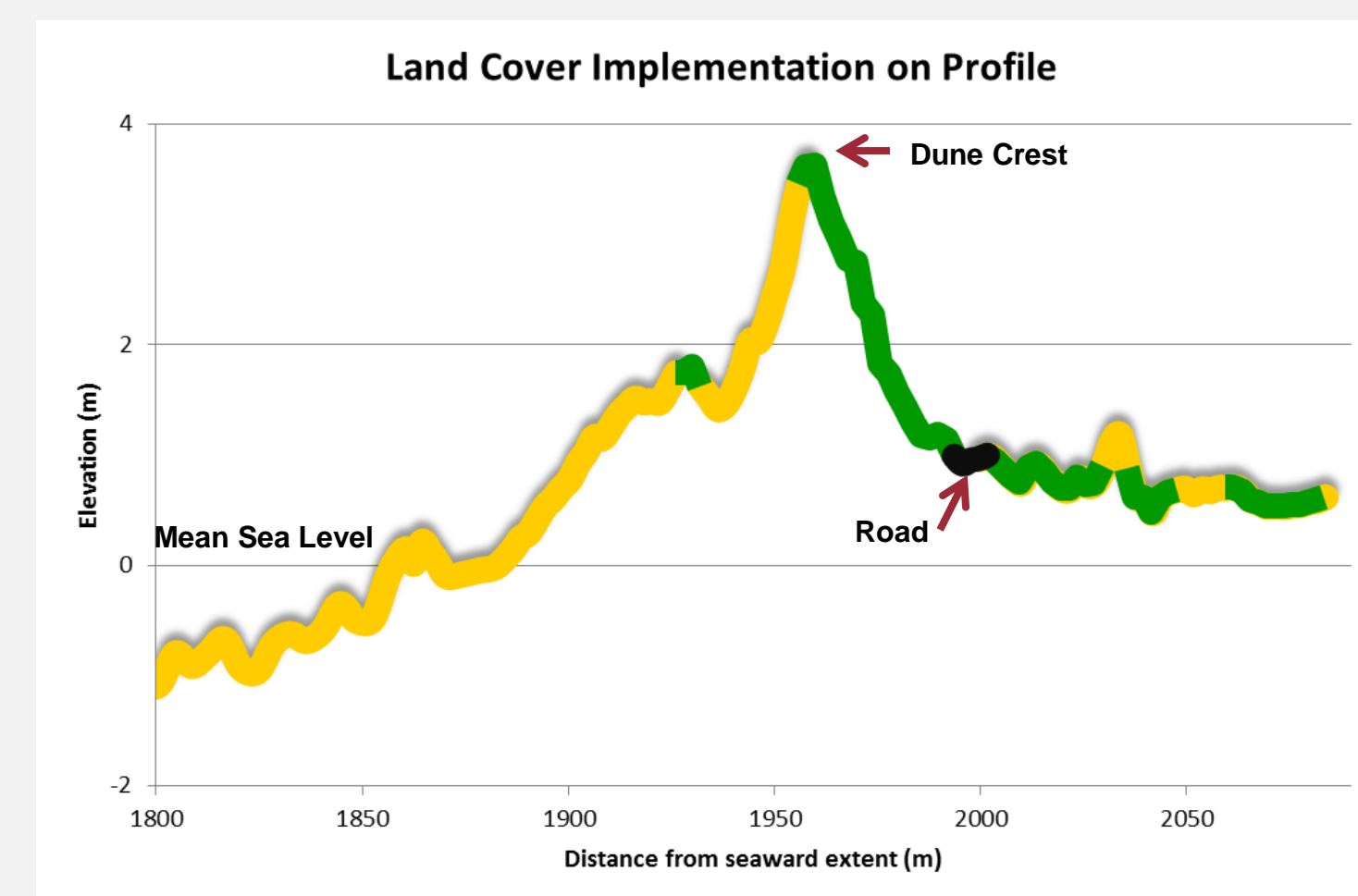
4. HOW TO INCLUDE LAND COVER?



In the model domain each node was assigned a land cover type using three classes.

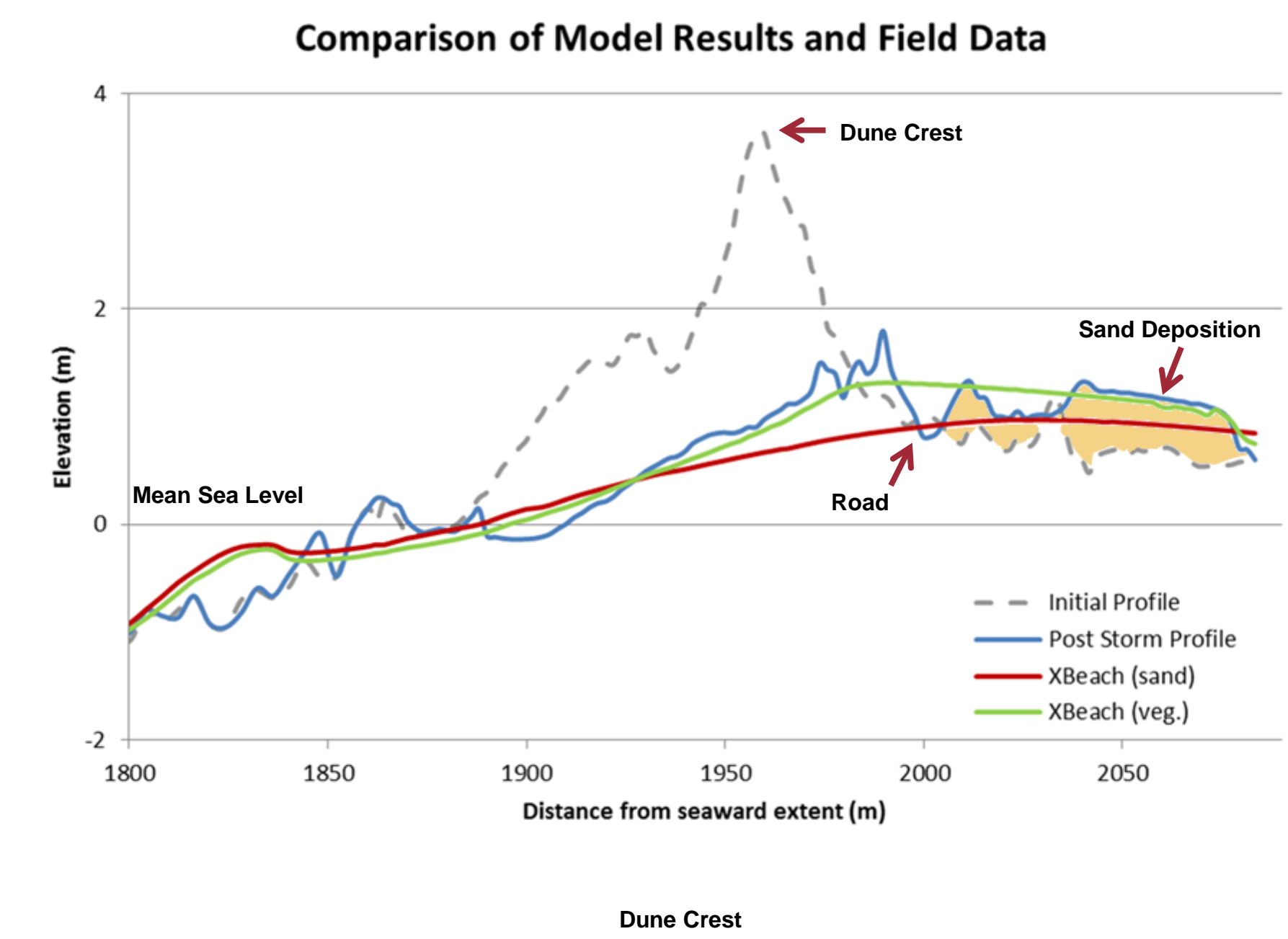
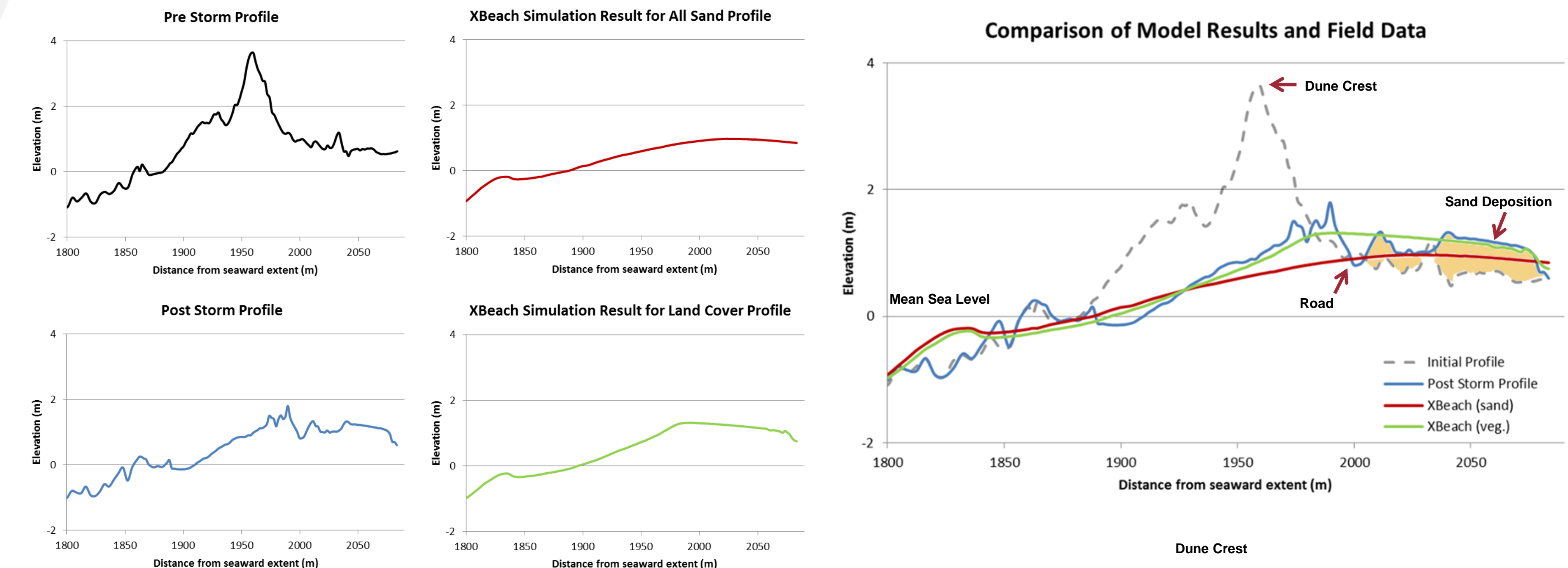


36 Pre and Post storm cross-shore profiles were generated along Pea Island using the land cover map produced for each storm.



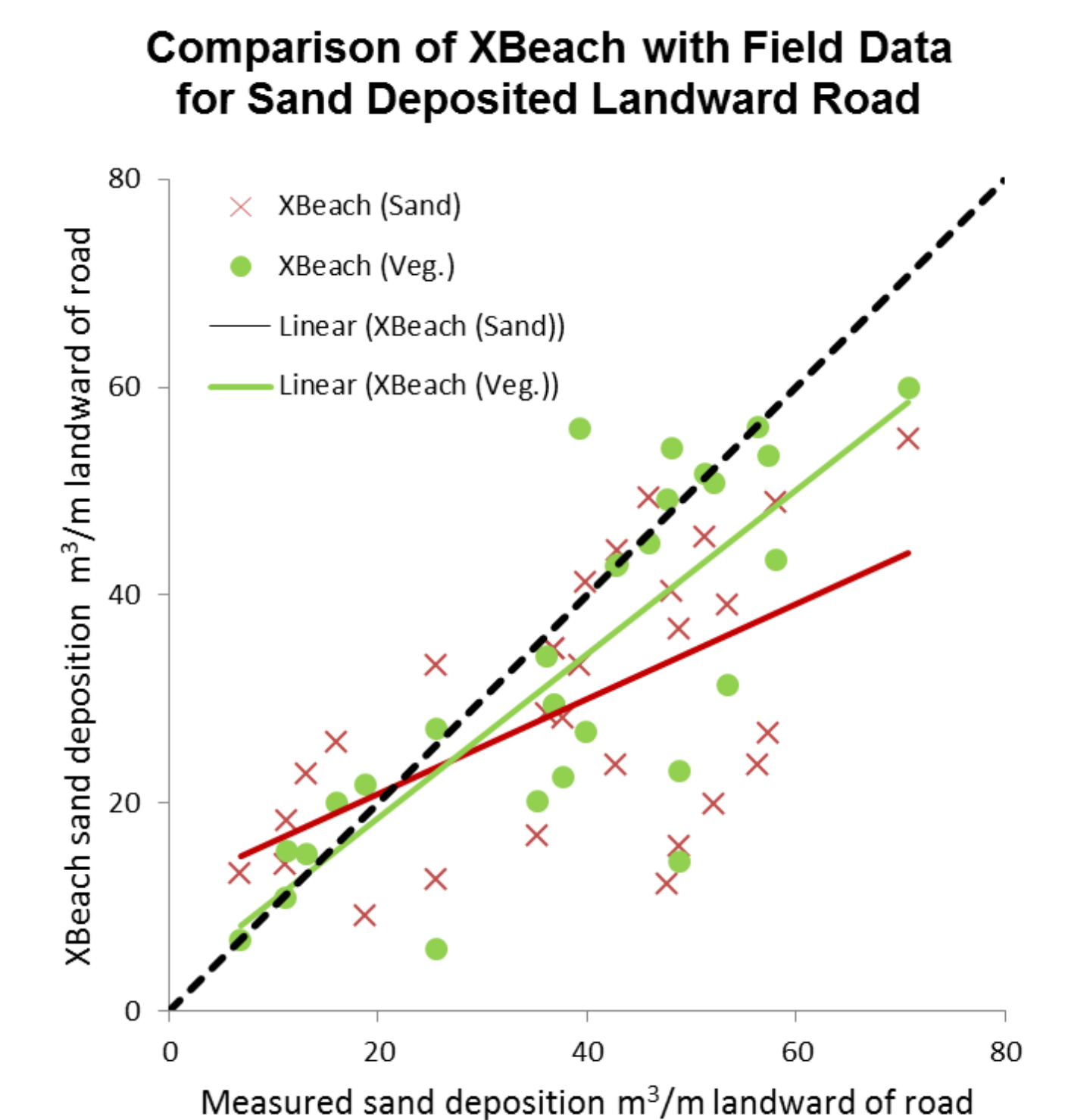
5. RESULTS

A 1D depth averaged approach was applied using **XBeach with and without land cover implementation** to determine the overwash caused by Hurricanes Isabel(2003) and Sandy(2012).



Results of the simulations were compared against post storm field measurements focusing on the landward extent of the washover fan.

Model results showed significant **improvements** in predicting overwash amounts **when land cover was incorporated**.



6. FUTURE WORK

- ❖ XBeach modeling with 2D based approach and validation of land cover calibration factors
- ❖ Determining the implications for coastal management
- ❖ Scenario testing to determine implications of climate change on coastal vulnerability

DISCLAIMERS

This material is partly based upon work supported by the Coastal Hazards Center of Excellence, a US Department of Homeland Security Science and Technology Directorate Center of Excellence under Award Number: 2008-ST-061-ND 0001. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the US Department of Homeland Security Science and Technology Directorate. Funding for this work was partly provided by Southeast Climate Science Center graduate fellowship awarded to Ayse Karanci.

QUESTIONS?



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COMMENTS