TILLAMOOK COUNTY COASTAL FUTURES PROJECT:

PROPERTY RISK STORYLINE

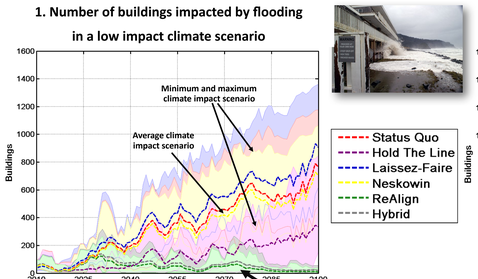
CIRC Climate Impacts Research Consortium

Sea Grant Oregon | OSU Oregon State University

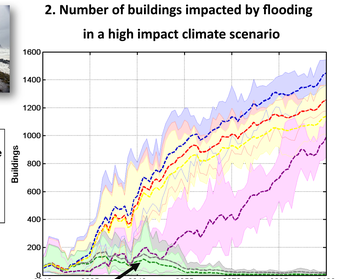
How will property be impacted by coastal flooding and erosion hazards in the future?

<u>Take Home Message:</u> Policies that move people and buildings away from coastal hazards are most successful in protecting property from flooding impacts whereas policies that permit the construction of BPS (e.g. rock revetments) protect property from erosion impacts.

1. Number of buildings impacted by flooding in a low impact climate scenario

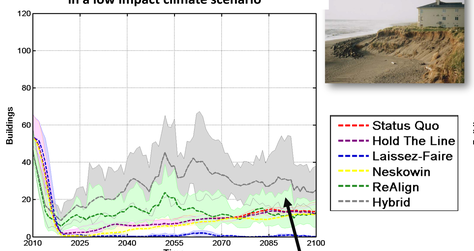


2. Number of buildings impacted by flooding in a high impact climate scenario

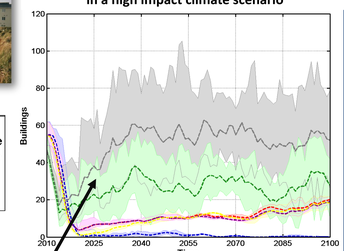


The low number of buildings impacted by flooding in the ReAlign and Hybrid scenarios are due to the movement of people and buildings outside of coastal hazard zones.

3. Number of buildings impacted by erosion in a low impact climate scenario



4. Number of buildings impacted by erosion in a high impact climate scenario



The greater number of buildings impacted by erosion in the ReAlign and Hybrid scenarios are due to the lack of new BPS construction.

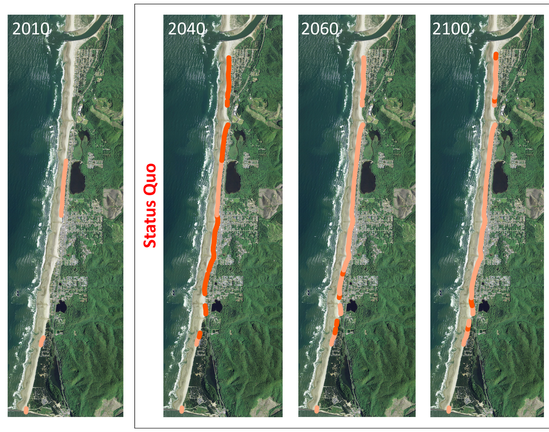
Key Points:

- The presence of BPS causes the beach to narrow, increasing vulnerability to coastal flooding.
- The number of buildings impacted by flooding and erosion hazards is greater in the high impact climate scenarios (Graph 2 and 4) than in the low impact climate scenarios (Graphs 1 and 3).
- The lack of BPS construction in the **ReAlign** and **Hybrid** policy scenarios results in **greater impacts to buildings by erosion** (Graphs 3 and 4).
- In the **ReAlign** policy scenario, the **fewest flooding impacts occur by 2100** compared to the other policy scenarios. This is due to both moving away from the coast and the limitation of BPS construction (Graphs 1 and 2).
- The **Laissez-Faire** policy scenario has the **least amount of buildings impacted by erosion** as property owners construct BPS (Graphs 3 and 4).

When will homeowners need backshore protection structures (BPS) to protect their property?

<u>Take Home Message:</u> To protect property from erosion, the majority of beachfront property owners would need to armor their properties prior to 2040.

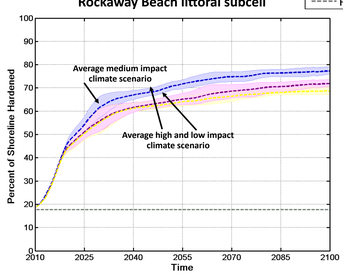
5. Locations of BPS over time in the Rockaway Beach Littoral Subcell under the Status Quo policy and a medium impact climate scenario



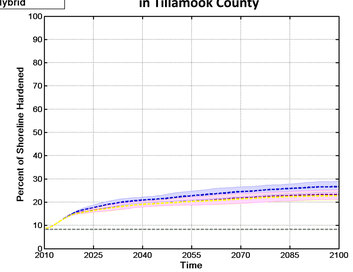
Backshore Protection Structure (BPS)

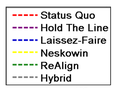
Existing BPS
New BPS

6. Percent of shoreline hardened in the Rockaway Beach littoral subcell



7. Percent of shoreline hardened in Tillamook County





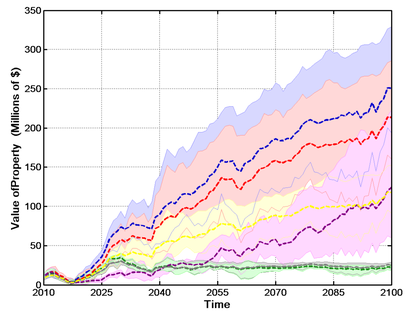
Key Points:

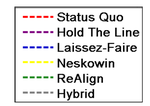
- **Few BPS are constructed after 2040** in the **Status Quo** scenario (Map 5) as the majority of eligible and developed lots are already armored.
- **More BPS are constructed** in the **Laissez-Faire** policy scenario overall, than in the other policy scenarios (Graphs 6 and 7).
- The percentage of shoreline hardened in the Rockaway Beach littoral subcell is greater than the percentage of shoreline hardened across the entire county (Graphs 6 and 7).

How do costs associated with protecting coastal property change over time?

<u>Take Home Message:</u> Cost associated with protecting the assessed value of coastal property increases overtime in all of the policy scenarios.

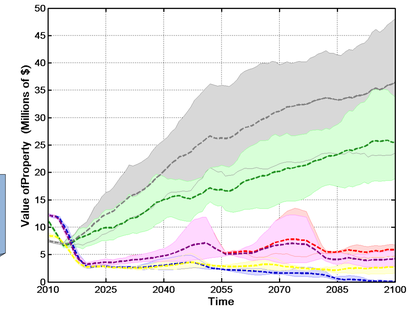
8. Assessed value of property impacted by flooding across Tillamook County



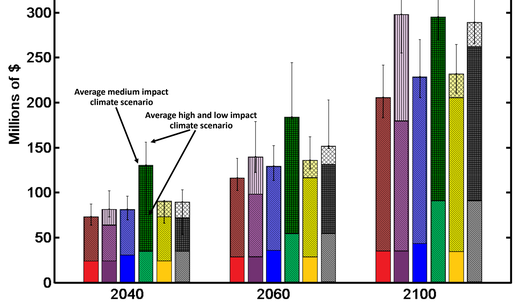


The value of property impacted by erosion under all policy scenarios is less than the value of property impacted by flooding.

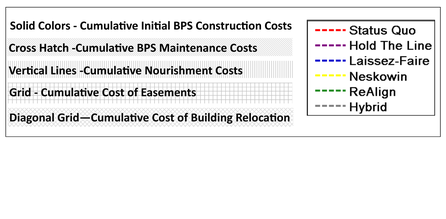
9. Assessed value of property impacted by erosion across Tillamook County



10. Cumulative costs associated with protecting coastal property across Tillamook County under the average medium impact climate scenario



Solid Colors - Cumulative Initial BPS Construction Costs
Cross Hatch -Cumulative BPS Maintenance Costs
Vertical Lines -Cumulative Nourishment Costs
Grid - Cumulative Cost of Easements
Diagonal Grid—Cumulative Cost of Building Relocation



Key Points:

- The assessed value of property impacted by flooding is greatest in the **Laissez-Faire** policy scenario due to both unrestricted development and growth, and BPS construction along the coastline (Graph 8). Conversely, the **Laissez-Faire** policy scenario results in the least amount of assessed value of property impacted by erosion over time (Graph 9).
- **BPS construction and maintenance costs** in the **Status Quo**, **Hold the Line**, and **Neskowin** policy scenarios are similar over time, but diverge towards the end of the century (Graph 10).
- The **greatest expenditures** for both BPS construction and maintenance occur under the **Laissez-Faire** policy scenario, costing ~$250 million between 2010 and 2100 (~$2.5 million per year) (Graph 10).
- The **ReAlign** scenario is most expensive as a result of the creation of easements (under the assumption that the assessed value of the property is equal to the cost of easement creation) (Graph 10).