



Realign Restore

Assumptions:

- Population growth is constant over the entire county, but population is allocated relative to current zoning.
- and Westport growing ~0.9% per year.
- Currently the people per dwelling unit is 2.0 throughout the whole county including the cities and rural areas.



Take Home Messages:

- By 2100, the total population of Grays Harbor County increases by approximately 21,000 people (Figure 1), at .3%/year.
- Ocean Shores experiences the largest increase in population, followed by Westport (Figures 3-7).
- Current development patterns vary across policy scenarios, since there is no development within the hazard zone under the **Realign** scenario.
- Available development capacity in Grays Harbor County varies significantly by city, with higher capacity in Westport and Ocean Shores (Figure 2).
- The number of buildings added within one mile of the shoreline **increases** in all policy scenarios, with approximately 5000 buildings added by the end of the century under the **Baseline** policy scenario (Figure 8).

GRAYS HARBOR COUNTY COASTAL FUTURES PROJECT: SCENARIO REVIEW MEETING

DRAFT DEVELOPMENT STORYLINE

• A single time series of population growth rate is used throughout all policies scenarios. The 0.3% growth rate is taken from 2010 Census Data. • Development capacity was increased for Ocean Shores and Westport (suggested by survey results), with Ocean Shores growing ~0.75% per year

- The FEMA 100-Year Flood Zone Hazard Area represents areas where there is a 1% chance of flooding every year, or a likelihood of flooding 1 out of every 100 years.
- In the Realign policy scenario, buildings are removed once they flood if they are located in the FEMA floodplain hazard zone. The buildings are then rebuilt away from the coast, outside of FEMA hazard zones.
- The cost of removing a home from the hazard zone is equal to the relocated property's value in 2010 dollars.

How does the implementation of hazard alleviation techniques alter development?



Figures 9 and 10: Intersection of FEMA 100-Year Flood Zones and the *Envision* model in Ocean Shores (left) and Westport (right).

— Realign High - Realign Medium Figure 11 : Cumulative ···· Realign Low cost of easements to remove buildings from the hazard zone in the **Realign** policy under **high, medium** and low impact climate scenarios (county-wide). 2050 2040 2020 2010 2030 2070 2080 Year

Cost of Buildings Removed from Hazard Zone

Take Home Messages:

- As development increases, the number of buildings in the hazard zone **increases**, although the number of homes starts to decrease in the Realign policy scenario as buildings experience flooding and are relocated out of the hazard zone (Figure 12).
- By 2100 under a high climate scenario, many buildings remain in the FEMA hazard zone under the Protect, Baseline and **Restore** policy scenarios. (Figure 12).
- Many buildings are removed (via easements) and relocated in safer areas in the Realign policy scenario across all impact climate scenarios (Figure 13).
- The cost to remove buildings (via easements) in the Realign policy scenario varies significantly across climate scenarios, but overall **increases** through time (Figure 11).





Policy Scenario Legend Hazard Alleviation Techniques (By Scenario): **Realign:** • FEMA 100-Year Flood high hazard zones are implemented and further development within hazard zones is restricted. • Buildings in the hazard zone that are flooded once are removed from the flood zone. • Dune restoration projects (DRP) are used to protect buildings, by rebuilding and nourishing dunes. While not currently implemented, we could also implement dune restoration projects to protect habitat or recreational areas along the outer coast if warranted. Backshore protection structures (BPS) are built to control erosion by armoring the dune face. Buildings Located within FEMA 100-Year Flood Hazard Zone Figure 12: Number of buildings within FEMA 100year flood hazard zone for all policy scenarios under High impact climate scenario (County-wide). 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 Year Annual Number of Buildings Removed from Hazard Zone Realign High - Realign Medium ····· Realign Low Figure 13: Annual number of buildings removed from the hazard zone in the **Realign** policy under **high, medium** and low impact climate scenarios (County-wide).