Envision Grays Harbor County Coastal Futures Project:
April 9, 2018

Recap, Results, and Next Steps Meeting

Our last meeting on April 18, 2017 explored initial results from the four policy scenarios (Baseline, Realign, Restore, and Protect; described in more detail below) co-developed by the Grays Harbor County Coastal Knowledge-To-Action Network (KTAN) in previous meetings. We received over 70 comments on the materials that were presented; many were implemented in the project, some of which include:

- Changes to population growth rates for specific communities
- Monetary caps on project spending
- Tracking habitats (Razor Clam/Eel Grass/intertidal area)
- End effects of Backshore Protection Structures
- Improved Flooding Model

A summary of responses to all comments made by the KTAN at our last meeting was emailed during summer 2017 and can be found at: http://explorer.bee.oregonstate.edu/Topic/GraysHarbor/Presentations.aspx.

The final phase of this project is an exploration of how policies could affect the future landscape and communities of Grays Harbor County. To do this, we use metrics as visualizations of model outputs, a selection of which can be found at the end of this packet. Also, in this packet is a review of the co-developed policy scenarios through which we will investigate alternative coastal futures of Grays Harbor County.

The objectives for our upcoming meeting are:

- Recap scenario development and modeling process
- Present and discuss modeling results
- Continue transforming information into usable knowledge

Please review this material before the meeting so that we can effectively explore the outcomes of the Grays Harbor Coastal Futures project together.

Policy Scenario Narratives

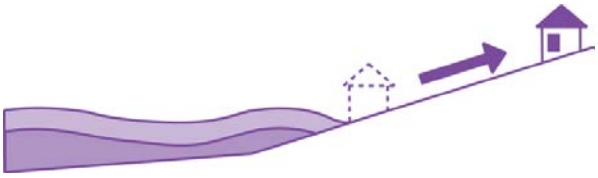
Scenario 1: Baseline

Continuation of present day policies. Adaptive measures are responsive rather than proactive, and provide a baseline to compare with other scenarios.

Policies Applied
• Community based development patterns (e.g. Ocean Shores will develop differently than Aberdeen) • Maintain existing Backshore Protection Structures (BPS) • Outer coast protection will be consistent county-wide • Bay flood protection will be held consistent with present day

Scenario 2: Realign

Policies or decisions are implemented that involve *changing* human activities to suit the changing environment (e.g., relocation of infrastructure and/or people).



Policies Applied
• Implement coastal hazard zones (FEMA 100-year flood zone) and restrict further development within the zones • Relocate buildings and homes to safest site of lot once impacted by hazards • Relocate existing homes out of hazard zones once impacted by hazards • Identify and note critical infrastructure (e.g., electric, sewers, fire stations) impacted by hazards • Prohibit new hard or soft protection measures (e.g. riprap revetments, beach nourishment, dikes/levees) • *Require property laws to disclose information about coastal hazards at point of sale*

Scenario 3: Restore

Policies or decisions are implemented that *accommodate* environmental change and prioritize habitat protection and conservation (e.g., restore dunes or nourish beaches).

Policies Applied

• Baseline development policies
• Prohibit new hard protection measures (e.g. BPS, dikes, levees, geotextile tubes)
• Use soft or green strategies for protection
  o Construct Dune Restoration Projects (DRP) and reinforce/rebuild existing projects *(consistent with existing sand characteristics (e.g. grain size))*
  o Add beach nourishment *consistent with existing sand characteristics* for locations where beach access in front of DRP has been lost (e.g., due to beach width reduction or frequent flooding).
  o *Stormwater management for flood reduction (e.g. rain gardens)*
• Protect, restore, and expand priority habitat areas
  o *Remove dikes*
  o *Use easements*
  o *Designate as conservation land*
  o Track evolving eelgrass habitat, razor clam habitat, and intertidal area (foraging bird habitat)

Scenario 4: Protect

Policies or decisions are implemented that involve *resisting* environmental change in order to protect existing infrastructure and human activities (e.g., building or strengthening the shoreline armor).

Policies Applied
• Baseline development policies • Maintain current Backshore Protection Structures (BPS) and allow more BPS or other hard structures (e.g., dikes, levees, geotextile tubes, sandbags) to be built for protection • Add beach nourishment *consistent with existing sand characteristics (e.g. grain size)* for locations where beach access in front of BPS has been lost (e.g., due to beach width reduction or frequent flooding). • Raise critical infrastructure (e.g., electric, sewers, fire stations) to FEMA base flood elevation once impacted by hazards • Raise existing homes to FEMA base flood elevation (BFE) once impacted by hazards. If homes receive continued impacts, relocate homes to the safest site of lot • *Increase size and/or number of pumps for flood management* • *Building codes to "accommodate" flooding (e.g. breakaway walls) when raised to BFE*

Italicized text indicates policies that are part of the scenario narratives but not explicitly modeled within Envision.

The tables below represents the specific KTAN developed policy groupings which make up the policy scenario narratives.

Policy	Baseline	Realign	Restore	Protect
BPS Construction				
BPS Maintenance				
BPS Nourishment				
DRP Construction				
DRP Maintenance				
DRP Nourishment				
Hazard zone development restrictions				
Remove Buildings From Hazard Zone				
Remove Critical Infrastructure from Hazard Zones				
Raise or Move structure to a new location in the same tax lot				
Raise Critical Infrastructure				

The tables below indicate some of the metrics that we will be visualizing as model outputs.

Examples of Shown Metrics

Buildings Impacted by Flooding	Location of Constructed BPS and DRP
Buildings Impacted by Event-Based Erosion	Cost of Backshore Protection Structure (BPS, $)
Buildings Impacted by Chronic Erosion	Total Cost of BPS Maintenance ($)
Road Impacted by Flooding	Cost of Beach Nourishment ($)
Road Impacted by Erosion	Cost of Dune Restoration Projects (DRP, $)
Beach Accessibility	Total Cost of DRP Maintenance ($)
Population	Flood and Erosion Frequency
Number of New Buildings and Location	Cost of Buildings Removed from Hazard Zone
Number of New Buildings Added Within One Mile of the Shoreline	Number of Buildings Removed from Hazard Zone
Number of Buildings Located Within the FEMA 100-Year Flood Hazard Zone	Available Development Capacity
Budget Allocation by scenario	Potential Razor Clam and Eelgrass Habitat

Examples of Additional Metrics Tracked in the Model (not necessarily shown on posters)

Subsequently Eroded Newly Developed Buildings	Spatially Averaged Dune Overtopping Days per Year
Critical Infrastructure in Hazard Zones	Spatially Averaged Dune Toe Impact Days per Year
Number of Surface Structures Impacted by Flooding	Spatially Averaged Maximum Yearly TWL
Flooded Area (sq. m)	Value of Developed Land Impacted by Erosion ($)
Spatially variable TWL Components	Value of Developed Land Impacted by Flooding ($)
Number of BPS Projects	Flooded Railroad Miles
Number of Buildings	Percent of Shoreline Hardened
Number of Nourishment Projects	Value of Flooded Property
Volume of Nourishment (cu m)	Number of DRP Projects
Beach Profile Geometry	Shoreline Recession Rates

More information on this project, a general timeline, and materials from the first three meetings can be found at http://explorer.bee.oregonstate.edu/Topic/GraysHarbor/Presentations.aspx