

# **Overview of Duck Beach Erosion & Its Potential Fiscal Impact**

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# Why are we here?

- **The Beach is the Town's biggest asset**
- **There are concerns that extraordinary erosion in spots threatens this asset**
- **There are concerns that left unaddressed the erosion could impact private property and lower the Town's tax base**
- **There is a desire by many for the Council to develop a strategy to deal with the erosion issue**
- **The Council is trying to determine the course of action they would like to pursue**
- **The Council is trying to determine if they wish to make the funding of a study on the erosion a priority for FY 2012**
- **In order to do this staff was asked to do an analysis of the potential impacts of the erosion, including fiscal**



# **What are we trying to answer?**

- **The impact of erosion on the shoreline based on historic erosion rates**
  - Structures impacted
  - Parcels impacted
- **The impact of continued erosion on the Town's tax base**
  - Effect on real estate taxes
  - Effect on shared revenues

# **What are we NOT trying to answer?**

- **The impact of erosion on the Town's reputation**
- **The impact of erosion on the ability of a property owner to rent their house or on rental rates**
- **The value of beach aesthetics vs. the protection of private property**
- **The exact components of any long term shoreline protection strategy**



# The Data

- **Staff utilized two primary datasets to develop future erosion scenarios**
  - **Historical shorelines and long-term average annual erosion rates published by the North Carolina Division of Coastal Management (Map Series One)**
  - **Digitized shoreline data and annual erosion rates generated from Dare County and USDA Digital Orthophotography - 1996-2010 (Map Series Two); annual erosion rates were modeled using the Digital Shoreline Analysis System developed by USGS**

# The Data

- **Three scenarios were developed for 10, 20, and 30 year horizons:**
  - **Low – This utilizes the long-term average annual erosion rate developed by DCM shown in Map Series One**
  - **Medium – This utilizes the DCM erosion setback factor that is used to calculate building setbacks from the FLSNV**
  - **High – This utilizes a combination of rates; either the DCM erosion setback factor or the erosion rate calculated in Map Series Two, whichever is higher**

# The Data

- **Building and Property Impacts were calculated for each scenario using GIS combined with Dare County Parcel Tax Data to determine fiscal impacts**
- **The analysis includes:**
  - **The number of structures impacted by erosion for each scenario**
  - **The impact of the erosion on the property values for each scenario**
    - **The land value was reduced proportionally to the area of the parcel lost to erosion**
  - **Total estimated real estate tax and shared revenues lost for each scenario**

# The Maps

- **Map Series One – DCM Historical Shorelines and average annual erosion rates**
- **Map Series Two – Shoreline Data and average annual erosion rates taken from Dare County and USDA Digital Orthophotography**
- **Map Series Three – Low erosion scenario**
- **Map Series Four – Medium erosion scenario**
- **Map Series Five – High erosion scenario**
- **Hot spot erosion analysis**

# **Fiscal Impact Analysis**

- **Baseline Data**
- **Low erosion scenario**
- **Medium erosion scenario**
- **High erosion scenario**

# Conclusions

- **Short-term - shoreline relatively stable except for “hot spot” area**
- **Trends indicate that “hot spot” erosion may level off**
  - **Long-term - erosion problems shift and often do not persist in one area; erosion is unpredictable**
- **In medium to high scenarios erosion becomes widespread problem in 20 to 30 year horizon**

## The Town should:

- **Develop a program to monitor shoreline changes**
  - **Partner with the USACOE to conduct a hot spot cause/effect study**
- **Analyze appropriate strategies to deal with hot spot (short-term) and widespread (long-term) erosion problems**
  - **Develop a formal shoreline protection and management strategy/policy**
    - **Analyze/develop funding mechanisms for implementation**

**Next Steps...**

