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BET4733 Introduction to Coastal Infrastructure

Data Collection

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Chapter Description

- ## Expected Outcomes

  Analyze the principles of wave mechanics, tides, littoral processes and coastal sediment transport in methods of shore protection and coastal infrastructures.

- ## References

1) Kamphuis, J. William, Introduction to Coastal Engineering and Management, Advanced Series on Ocean Engineering-Volume 30, World Scientific, 2010.
2) Reeve D., Chadwick A. and Fleming C. Coastal Engineering-Processes, Theory and Design Practice, CRC Press, 2015.
3) Kim Y.C., Design of Coastal Structures and Sea Defences, World Scientific, 2015.
4) US Army Corps of Engineers. Coastal Engineering Manual, Washington, 1998-now.

CONTENTS

- The Importance of Data Collection
- Data Collection and Analysis

THE IMPORTANCE OF DATA COLLECTION

1) Establish design parameter
2) Improve design confidence
3) Model calibration and validation

DATA COLLECTION AND ANALYSIS

Types of Data	Source	Application
Topography and Bathymetry	Hydrographic survey	1. Model set-up 2. Depth
Wind	Malaysia Meteorological Department	1. Wave hindcasting 2. Wave climate
Tide	1. Field/in-situ measurements 2. Predicted data obtained from Annual Tide Tables published by Royal Malaysian Navy	1. Details water level fluctuations required in coastal engineering design

DATA COLLECTION AND ANALYSIS

Types of Data	Source	Application
Wave	1. Field/in-situ measurements 2. Department of Irrigation and Drainage Malaysia	1. Deepwater wave statistical data and wave transformation to obtain details of nearshore wave conditions 2. Statistical analysis to predict extreme wave values required in the design of coastal structures

DATA COLLECTION AND ANALYSIS

Types of Data	Source	Application
Current	Field/in-situ measurements	1. Wave Hincasting 2. Wave Climate 3. Sediment transport study
Soil	Field/in-situ measurements	1. Design of coastal structures 2. Sedimentation study
Water Quality	Field/in-situ measurements	1. Water quality study 2. Sedimentation study

DATA COLLECTION AND ANALYSIS

Types of Data	Source	Application
Shoreline changes	Aerial photographs Satellite images	1. Rate of erosion/accretion 2. Sediment budget analysis
Historical Information	Charts, maps, drawings, reports & information from relevant department	1. Secondary data 2. Calibration & Validation

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