

MONASH SCIENCE

Improving Coastal Erosion Assessments for Victoria – Embayments and Living Shorelines

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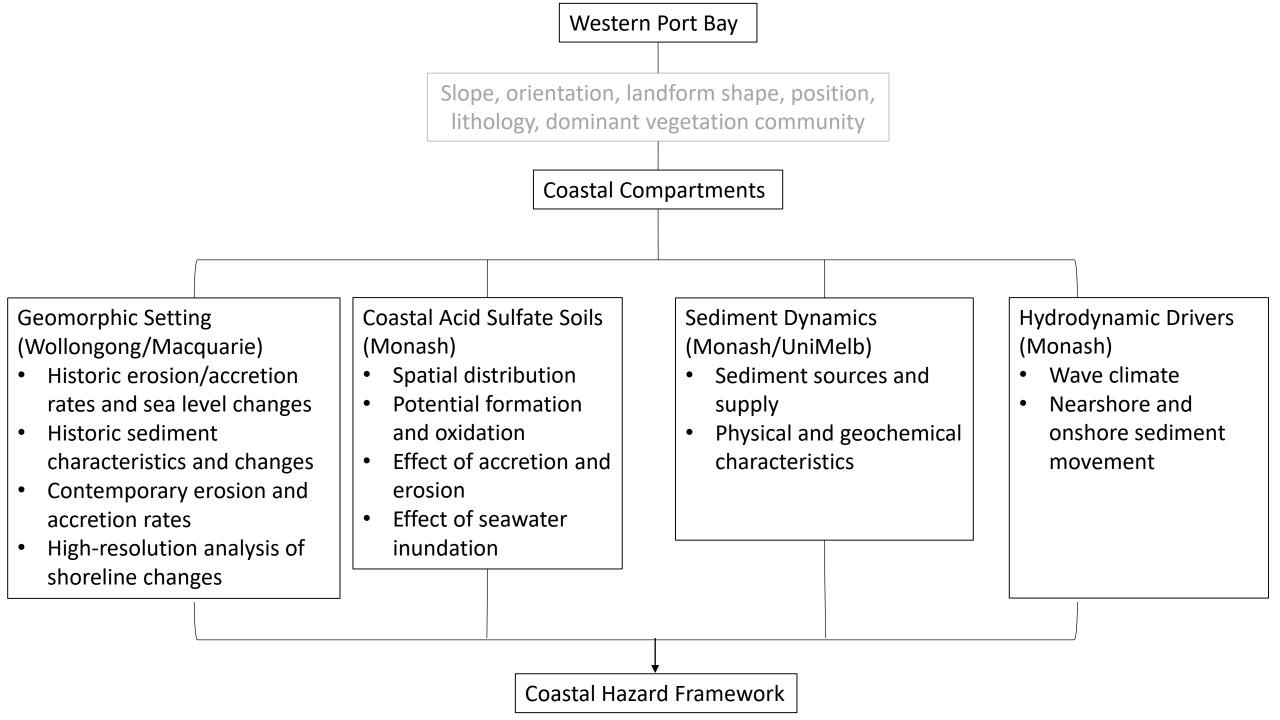


Overview



- Data on erosion risk and hazard in Victorian embayments is often patchy with limited potential for seamless integration
- Quantifying erosion and accretion rates across a number of timescales is necessary for understanding changes in shoreline dynamics
- This project will use 4 themes to address coastal erosion hazard assessment in embayments
 - Integrate the most important drivers of change (wave climate and sea level) with sources and sinks of sediment





Coastal Compartments and Geomorphic Setting



- Wollongong Uni (KR)
 - Coastal Compartments
 - Grouping of shoreline segments of similar geomorphic behavior via statistical analysis using inputs including slope, orientation, landform shape, position, lithology, dominant vegetation community
 - Geomorphic Setting
 - Contemporary erosion and accretion rates
 - SET repairs, maintenance and monitoring; establish new SET sites at Corner Inlet and other Western Port locations
 - Historic erosion/accretion rates and sea level changes
 - 210Pb and ¹³⁷Cs dating of cores
 - Historic sediment characteristics and changes
 - Grain size analysis and characteristics

- Macquarie Uni (NS)
 - Geomorphic Setting
 - High resolution digital shoreline analysis (erosional and depositional): Rates of change across geomorphic settings
 - Erosional shoreline monitoring

Sediment Dynamics



- Monash (RR)
 - Sediment sources and supply
 - Use of eDNA to identify sources
 - Use of geochemical indicators to identify sources

- Monash (VW)
 - Physical and geochemical characteristics of transported and deposited sediment
- Uni Melb (DK)
 - Sediment sources and supply
 - Role of cliffs and cliff erosion as sources of sediment

Hydrodynamic Drivers



- Monash (RR)
 - Wave climate
 - Nearshore and onshore sediment movement
 - Determine how sediment (SSC) and waves translate from nearshore onto and along the marsh platform
 - Use remotely sensed proxies for vegetation 'roughness' and density using UAVs (multispectral)
 - Thermal imagery to quantify sheet flow along the marsh platform to establish surface roughness (with a high resolution DEM as reference)
 - Model how the nearshore wave and sediment regime affects the vegetation type forming on the shoreline

Coastal Acid Sulfate Soils



- Monash (VW)
 - Spatial distribution
 - Link between sediment and soil characteristics in each geomorphic unit with vegetation type
 - Potential formation and oxidation
 - Variations in inundation on formation and oxidation: permanent inundation, wet/dry cycles
 - Rates of formation and acidification with different organic matter (saltmarsh, mangrove, terrestrial species)
 - Effect of accretion and erosion
 - On rates of formation and oxidation
 - Effect of seawater inundation
 - On rates of formation and oxidation

Study Sites





