

# W7 Sediment Dynamics: Major sources and fate of sediments in streams, wetlands, estuaries and bays to inform management opportunities.

## Objective(s)

To improve models of urban, peri-urban and rural sediment budgets and to inform plans and strategies to decrease sediment loads to receiving waters, with a focus on the Westernport catchment.

## Why this research is important

Western Port is sensitive environment, containing seagrass beds that are under threat from light attenuation, due to fine sediment inputs from the catchment and coast. A sediment load target was specified to allow sediment to flush from seagrass areas of the bay. Melbourne Water, in partnership with DEECA, is now scoping the need for further planning to achieve that target based on commitments in existing strategies and plans for Westernport.

While sediment loads from rural lands and channel erosion are reasonably well-understood, several uncertainties remain around sediment sources in the catchment, including a knowledge gap on sediment liberated by different stages of urban development. There is also a need to better quantify aspects such as bank erosion and sediment deposition/resuspension. These knowledge gaps need to be addressed in order for Melbourne Water to manage sediment loads to Western Port in accordance with the Environment Protection Act.

### Contribution to Key Research Areas

- Port Phillip Bay and Western Port  
*Undertake priority research projects identified in the Western Port Environment Science Review and synthesis report*

## Achievements to date

- Development and improvement of low-cost sediment monitoring techniques, including systems to improve the reliability of telemetry and the management and visualisation of received data.
- Monitoring of sediment transport, floodplain sediment levels, creek cross-sections and turbidity in the rapidly urbanizing suburb of Officer.
- Field validation of gully activity levels based on evidence of vertical banks, headcuts and vegetation cover.

## Approach for year 3

This research will focus on two core components during its third year:

- **Suspended sediment fingerprinting study.**  
Developing a new approach to pinpoint the contributions of different sediment sources to suspended loads in waterways (Officer Creek case study). Will also benchmark alternative, lower-cost methods against gold-standard tracers, which may allow this technique to be applied at lower cost and/or broader scale in future studies.
- **Low-cost turbidity monitoring.**  
Will explore opportunities to deploy and use the low-cost monitoring systems used in the project to give better intelligence about sediment transport in various environments and sedimentation in Melbourne Water's assets.

## Key outputs for year 3

- Proof-of-concept for scaling up low-cost sensors to larger investigations, and technical advice on their broader scale application.
- Technical specifications and protocols for building and using low-cost turbidity sensors.
- Final technical report on sediment sampling in Quirks and Officer Creeks
- Report on sediment fingerprinting study findings.

## Expected benefits

- Refined capability to model sediment loads from urban construction.
- Better understand the relative risk of specific stages of urban construction versus mature urban estates in terms of sediment loads.
- Support the evaluation of management opportunities to reduce sediment loads from urban construction.
- Better understand the relative contributions of specific sources of sediment in urbanising areas
- New understanding of sediment transfer in peri-urban areas.

## For more information

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