

# Major sources and fate of sediments in streams, wetlands, estuaries and bays to inform management opportunities

Sediment  
Budget  
Project B2

The project will support improved conceptual models of urban and rural sediment budgets, quantification of the role of urban construction phases in sediment supply, and validation of sediment management tools.

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Waterways, estuaries and bays are sensitive to changes in sediment load, due to sedimentation and light attenuation, as well as nutrients and toxicants that attach to sediment particles. Receiving water like Western Port are particularly sensitive, containing seagrass beds that are under threat from light attenuation, due to fine sediment inputs from the catchment and coast.

With a focus on the Westernport catchment, this project will investigate aspects of the sediment budget that are currently poorly understood.

Sediment loads from rural lands and channel erosion are reasonably well-understood as a result of previous research on sediment budgeting. However, several key uncertainties remain, including a key knowledge gap around sediment liberated by different stages of urban development in the catchment.

There is also a need to better quantify aspects such as gully erosion, bank erosion (identified as the major contributor to sediment loads in the dSedNet model), sediment deposition and resuspension.

This research program aims to improve models of urban, peri-urban and rural sediment budgets, to inform plans and strategies to decrease sediment loads to receiving waters.

#### Methodology

To date, the project has made considerable progress on improved conceptual models of urban construction sediment generation, installation and refinement of monitoring sites, and development of

collaborations and grant proposals. In the coming year, the project will:

- Install automatic cameras at all sites to remotely monitor flow conditions and equipment.
- Undertake suspended sediment sampling using autosamplers, compute sediment load at each site and construct quantified sediment budgets .
- Conduct surveys of channel cross-sections between upstream and downstream sites to monitor changes in cross-section and bed sediment levels over time. Similarly, bathymetry surveys of major ponds, sediment basins and wetlands will be undertaken annually to compute sediment loads captured relative to sediment exported.

Additionally, the project will fund (through a joint French-Australian initiative), two PhD projects: i) Variability of hillslope erosion and sediment delivery within the catchments ; and ii) Sediment transfer in peri-urban streams and its interaction with riverbed morphology.

#### Expected outcomes

- An understanding of the relative sediment load contribution of different urban development stages compared to mature estates.
- An understanding of what measures/policies are required to effectively meet SEPP load targets for Westernport.
- Validation of components of previous sediment budget modelling