

Matthew Eliot

Matt Eliot is a coastal engineer with over 13 years professional experience covering a wide range of coastal, estuarine and maritime projects around Australia. He has been involved in all phases of coastal engineering projects, including investigations, analysis, design, contract management, site supervision, project management, project review and structure failure assessment. Matt joined Coastal Information and Engineering Services in 1993 and assisted with the Dawesville Channel Project, design of Exmouth Boat Harbour and the Western Australian State Government maintenance dredging program.

From 1996 to 2002, Matt worked with Egis Consulting Australia (formerly CMPS&F Pty Ltd) as part of the marine and coastal engineering team. Highlight projects included review of Bunbury storm surge barrier operations, refurbishment of Broome Jetty and Coral Bay boat launching facility investigations, with a wide range of design and construction projects throughout Australia and Southeast Asia. In 2002, Matt commenced work as an independent coastal engineer, through Damara WA Pty Ltd. Within this role, he has undertaken an increasing number of projects in collaboration with GEMS, including dredge plume modelling at Dampier and cyclone impact studies for Efate and Tuvalu.

In 2006, Matt joined GEMS in a more formal capacity, working on a range of projects throughout the Australian region. Recent projects include wave climate assessment for Mooloolaba, wave load analysis for Gold Coast Desalination Plant and cyclonic inundation studies for Coral Bay and Quobba.

Education

1989 – 1991

University of Western Australia

Bachelor of Science

Applied Mathematics

Mathematical Statistics

1989 - 1993

University of Western Australia

Bachelor of Engineering (Civil)

Coastal Engineering

Applied Hydrology

Rock Mechanics

Environmental Modelling

Professional memberships

Graduate Member, Institution of Engineers, Australia

* eligible for MIEAust status

Member, Permanent International Association of Navigational Congress

**Professional
experience**

**1993 - 1996 Department of Transport Maritime Division
Graduate Engineer**

Undertook a wide range of duties supporting senior engineering staff, particularly assistance to the Department's Senior Project Manager Mr John Shand. Projects included:

Dawesville Channel:

- Co-ordination of the marine environmental monitoring program for Dawesville Channel.
- Analysis of littoral processes for the purpose of Dawesville sand bypassing program.
- Assessment of water level response within Peel Inlet and Harvey Estuary to ocean water levels and wind fluctuations.
- Design of repairs to breakwaters and training walls.

Mandurah Channel:

- Assessment of sedimentation patterns and littoral processes for Mandurah Channel dredging and Mandurah Channel sand bypassing program.

Koombana Bay:

- Determination of shoreline fluctuations and assessment of beach stability.

Australian Maritime Safety Authority:

- Review of Oil Spill Modelling Systems applicable to West Australian coastline.

Carnarvon Fascine Development:

- 1-D modelling of tidal flows within Carnarvon Fascine and proposed canal development.
- Evaluation of tidal flushing conditions.
- Assessment of erosion potential and design of appropriate bank protection systems.

Kalbarri – Murchison River Entrance:

- Assessment of littoral process for Murchison River mouth for maintenance dredging program.
- Investigation of alternatives for improvements to boating access for the Murchison River mouth. Factors to be considered included combining fluvial and coastal littoral transport mechanisms.

Denham Boat Harbour:

- Maintenance dredging program and environmental management plan.

Exmouth Boat Harbour:

- Design of Exmouth Boat Harbour breakwaters, including wave penetration study.

Geraldton Small Boat Harbour:

- Investigation of the stability of beaches adjacent to Geraldton Boat Harbour.
- Design of beach reclamation project, including shore protection works.

**Professional
Experience**

(Continued)

Endeavour-Leeuwin Moorings:

- Design of short-term four-point catenary moorings to be used for the Endeavour and Leeuwin sailing ships during Dawesville Channel opening ceremony.

Minor Projects:

- Design and repair of minor marine structures, including floating jetties, moorings, shore-connected groynes and navigation aids.
- Assessment of potential threat caused by storm-induced erosion throughout the metropolitan region, through to Mandurah.
- Investigation and assessment of marine environmental and coastal processes.

**1996 Beach Management Services (family company)
Engineer**

Was engaged on short-term contracts for the following projects:

Kakadu National Park:

- Investigation of tidal creek expansion in the Alligator Rivers region.
- Preparation of a program for monitoring and assessment of coastal change.

Rottnest Island:

- Assessment of navigation aid design wave forces for combined sea and swell.

Exmouth Peninsula:

- Assessment of navigation aid design wave forces for cyclonic conditions.

**Professional
Experience**

(Continued)

1996 - 1998

CMPS&F Pty Ltd

Coastal Engineer

This role commenced as an assistant to Mr Nello Siragusa and developed through to being part of a team of 8 engineers and design drafters. Duties included design, site management, contract preparation, marketing and mentoring for graduate engineers. Projects include:

Bunbury Storm Surge Barrier: *Dept Transport*

- Investigation and quantification of the processes governing operation of the Bunbury storm surge barrier.
- Condition assessment of the barrier.
- Preparation of a revised Operations Manual for the storm surge barrier.

Dampier Marine Services Industrial Estate: *Dept Commerce & Trade*

- Investigation of coastal and fluvial processes influencing the proposed site for Dampier Marine Services Industrial Estate.
- Preliminary layout design and cost evaluation.

S&K Barge Ramps, Myanmar:

- Design of boat ramps suitable for traffic by regional river ferry.
- Design of associated protective river breakwater, including shear protection system.

Breakwater Repairs - Hopetoun & Port Denison: *Dept Transport*

- Project management of repairs to rubble mound breakwaters.

Coral Bay Coastal Process Study: *Dept Transport*

- Photogrammetric shoreline movement study in the vicinity of Coral Bay town site.
- Desktop study of coastal processes, including statistical evaluation of cyclonic wave conditions.

John's Creek Boat Harbour: *Dept Transport*

- Evaluation of existing harbour layout and wave penetration.
- Determination of appropriate cyclonic wave protection system.
- Design of recommended wave protection system.

Zod & Meghradzor Gold Mines, Armenia:

- Financial sensitivity analysis of Armenian gold mines, combining open pit and underground mining.
- Evaluation of gold and silver hot spots.

Fremantle Sailing Club: *Fremantle Sailing Club*

- Design and project management of repairs to Fremantle Sailing Club main breakwater.

Tweed River Sand Bypassing Jetty, Queensland: *Clough*

- Preliminary design of 450-m jetty structure used for operation of Tweed River slurry transport fixed sand-bypassing system.

Ports of Broome and Wyndham: *Dept Transport*

- Project management of deferred maintenance works at the Ports of Wyndham and Broome, including painting refurbishment, cathodic protection system, and maintenance dredging.

Professional Experience

(Continued)

Bunbury Stormwater Outfall Upgrade: *City of Bunbury*

- Design of a pile-mounted stormwater outfall to cater for a dynamic beach system.

Broome Floating Breakwater: *Dept Transport*

- Assessment of wave attenuation for a floating breakwater system
- Determination of the ambient wave climate for the Port of Broome.
- Preliminary structural design of the floating pontoon units.

Cables Station Artificial Surfing Reef: *Dept Transport*

- Project management of design review program.
- Investigation of construction methodology and design.

1998 - 2002

Egis Consulting Australia

Coastal Engineer

Engaged on a casual basis, specific projects include:

Queenscliff Small Boat Harbour: *Parks Victoria*

- Assessment of sedimentary and flushing processes for proposed modification of Queenscliff Boat Harbour, Victoria.

Port Giles Facility Upgrade: *Flinders Ports*

- Assessment of coastal environment and review of active coastal processes.
- Recommendations for reclamation methods.

Review of Historic Dredging Practices: *Flinders Ports*

- Review of historic dredging practices and environmental management strategies as the basis for proposed dredging operations at Adelaide Outer Harbour.

Kuala Belait Breakwater: *IEC Brunei*

- Impact assessment on sedimentary processes for Belait River training wall and channel dredging.
- Concept design for mitigation works.

Mounts Bay Road Riverwall: *CCD Australia*

- Failure analysis and assessment of remedial works for 600m of gabion walling.

King Bay Supply Base, Small Boat Landing: *Monadelphous*

- Detailed concept design for a pilot boat floating landing system.
- Port Denison Recreational Jetty Marine & Civil
- Detailed concept designs for alternative fixed and floating jetty structures.

Hillarys & Challenger Breakwater Repairs: *Dept Transport*

- Condition assessment and specification of appropriate repairs.
- Site management of repair works.

Best Roads Weather Risk Study: *Best Roads Group*

- Assessment of rainfall event frequency across Western Australia.
- Assessment of tropical cyclone frequency and intensity across Western Australia.

**Professional
Experience**

(Continued)

- Austal Ships Jetty Stability:* *Austal Ships*
- Assessment of berth face stability under the influence of a 690 kW Kamewa water jet.
- North Java Iron Ore Facility:*
- Model of dredged channel stability under tidal and wind-driven currents.
 - Financial model to define appropriate length of jetty and dredged channel.
- Jervoise Bay Southern Harbour:* *Thiess*
- Detailed wave and water level climate study.
 - Preliminary breakwater and revetment design.
- Jervoise Bay Northern Precinct Development:* *LandCorp*
- Preliminary wave climate study and seawall design.
 - Wave penetration modelling and interpretation.
 - Dredge area stability assessment.
- Broome Jetty Deck Repairs:* *Dept Transport*
- Structural analysis of damage to jetty concrete deck, including thermal expansion.
- Exmouth Extreme Storm Water Levels:* *Dept Transport*
- Parametric cyclone modelling to evaluate stormwater level recurrence intervals, and define required building levels.
- Coral Bay Boat Launching Facility:* *Dept Transport*
- Feasibility investigation and financial comparison of four alternative boat launching facilities, including preliminary design and investigation of sediment transport processes.
 - Coastal and marine structure engineering, including preliminary facility design for multiple options. This included design of piled causeways, fixed moorings, rubble-mound groynes and piled skirt-breakwaters.
- Melbourne Water Shoreline Study, Victoria:* *Melbourne Water*
- Study methodology development and review of shoreline processes for Melbourne Water's Western Treatment Plant.
- Cables Station Artificial Surfing Reef:* *Dept Transport*
- Rock armour design.
 - Construction inspection and reporting.
- Port Hedland Storm Surge Review:* *Ministry for Planning*
- Review of cyclone modelling applied to Port Hedland town site and recommendation of improved modelling process.
- Broome Floating Breakwater:* *Dept Transport*
- Evaluation of structural design loads.
- Victor Harbour Recreational Jetty:*
- Wave climate assessment, piling and deck design for a fixed jetty access to a recreational pontoon.
- Department of Transport Wave Database:* *Dept Transport*
- Development of meta-database for Department of Transport wave records throughout Western Australia.
 - Identification of data significance by site, for conversion to current digital formats.

Professional Experience

(Continued)

- Dampier Sedimentation Study:* *URS / DPA*
- Modelling of silt suspension associated with dredge operations
 - Model verification field program
- Varanus Island Mangrove Stability:* *Apache*
- Field survey of mangroves and pocket beaches
 - Review of historic monitoring programs
 - Cyclone track and character analysis
- Foreshore Condition Assessment:* *City of Melville*
- Condition survey and process analysis for Mt Pleasant Foreshore
 - Advice regarding options for structural protection
- Foreshore Rehabilitation:* *City of Bayswater*
- Advice regarding foreshore stabilisation and design of both soft and fixed engineering systems
- Point Fraser Stage 2 Foreshore Redevelopment* *Syrinx Environmental*
- Assessment & design of foreshore protection systems
 - Layout & preliminary design for public jetty
 - Management of pocket beach construction
- Hillarys & Challenger Breakwater Repairs:* *DPI*
- Condition assessment and specification of appropriate repairs
 - Site management of repair works
- Goodwood Parade Boat Ramp Protection* *SRT*
- Preliminary assessment of shore protection requirements
- Broun Bay Stabilisation Assessment* *URS / RAN*
- Analysis of beach structure and historic change
 - Design of stabilisation structures
- Metropolitan Beach Use Study 2005* *DPI*
- Statistical analysis of beach use patterns
 - Interpretation and reporting
- Gulf of Carpentaria Climate Change Evaluation* *DEH*
- Assessment of environmental databases
 - Evaluation of climate change detection techniques
- Tropical Rivers Inventory and Assessment Project* *eriss*
- Assessment of environmental databases
 - Review of estuarine classification systems
 - Evaluation of climate change detection techniques
- Ascot Inn Town Planning Appeal* *DPI*
- Review of shoreline stability
 - Preparation of professional witness statement
 - Representation at Town Planning Appeals Tribunal
- Coral Bay Sedimentation Assessment* *DPI*
- Review of shoreline stability
 - Analysis of sedimentation rate expected due to construction of boat ramp

Yunderup Sedimentation Assessment *DPI*

- Review of historic sedimentation patterns
- Analysis of wind and water level data
- Interpretation of expected sedimentation pathways

Barrow Island Beach Stability *DPI / EPA*

- Site inspection of beach structure and processes
- Analysis of wind and water level data
- Interpretation of expected shoreline change associated with construction of Gorgon MOF wharf

BP Kwinana Water Level Variability *UWA*

- Detailed analysis of Fremantle water level record
- Interpretation with respect to management of groundwater pollutants

Cottesloe Groyne Repairs *DPI / Cottesloe*

- Review of structural design
- Superintendent's representative for groyne repairs

Whaleworld Sedimentation Analysis *DPI*

- Interpretation of beach surveys, to identify changes associated with Whaleworld breakwater

Cockburn Coastal Process Study *Oceanica / DPI / Cockburn*

- Inspection and condition assessment of coastal protection structures
- Review of available coastal setbacks and available management options

2005-06 **Oceanica Pty Ltd**
Senior Coastal Engineer

Engaged on a casual basis, specific projects include:

Secondment to Department for Planning & Infrastructure *DPI*

- Coordination of coastal data collection and management program
- Provision of advice to State and Local Government agencies regarding coastal management
- Management of coastal protection program

Penguin Island Erosion Study: *CALM*

- Review of historic dredging practices and environmental management strategies as the basis for proposed dredging operations at Adelaide Outer Harbour.

Exmouth Water Level Assessment *DPI*

- Review of water level and cyclone databases
- Evaluation of extreme coastal events

