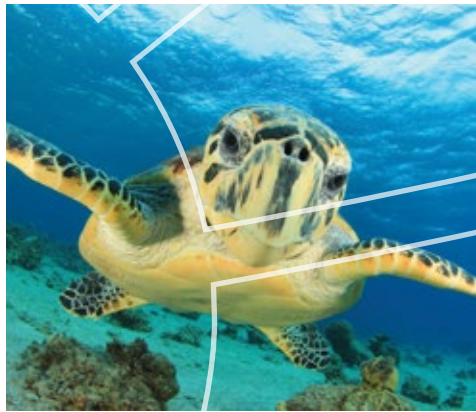




Clarity from complexity



Water and environment Capability statement

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The company

BMT is a leading international multi-disciplinary engineering, science and technology consultancy offering a broad range of services, particularly in the energy, environment, shipping, ports and logistics and defence sectors. Clients are served by professionals located in a network of international subsidiary companies in over 30 offices and across 5 continents.

BMT has the in-house skills to provide an integrated engineering, ecological and scientific service to our clients. The diversity and strength of our staff enables us to provide innovative and practical solutions, supported by comprehensive field data capability and sophisticated numerical modelling.

Operating domestically for nearly 50 years, BMT now has more than 150 professionals based in Australia, specialising in Water and Environmental Management with a track record of successful project delivery. Our ongoing success is found in our people's dedication to scientific, technological and engineering excellence, value for money and a determined customer focus.

BMT specialises in:

- Environmental impact assessments
- Hydrology and flood hydraulics
- Floodplain management
- Flood intelligence

- Water quality
- Climate change
- Marine, freshwater and terrestrial ecology
- Coastal processes and management
- Integrated total water cycle management
- Expert services
- Geographic information systems and web development
- Field data capture
- TUFLOW software

Environmental impact assessments



BMT has an international reputation for preparing high-quality Environmental Impact Assessments (EIA), Environmental Management Plans (EMP) and associated studies.



Preparation of such documents requires a comprehensive knowledge of all relevant national, state and local authority regulations, standards and practices that apply and the reporting requirements to satisfy the various approval processes.

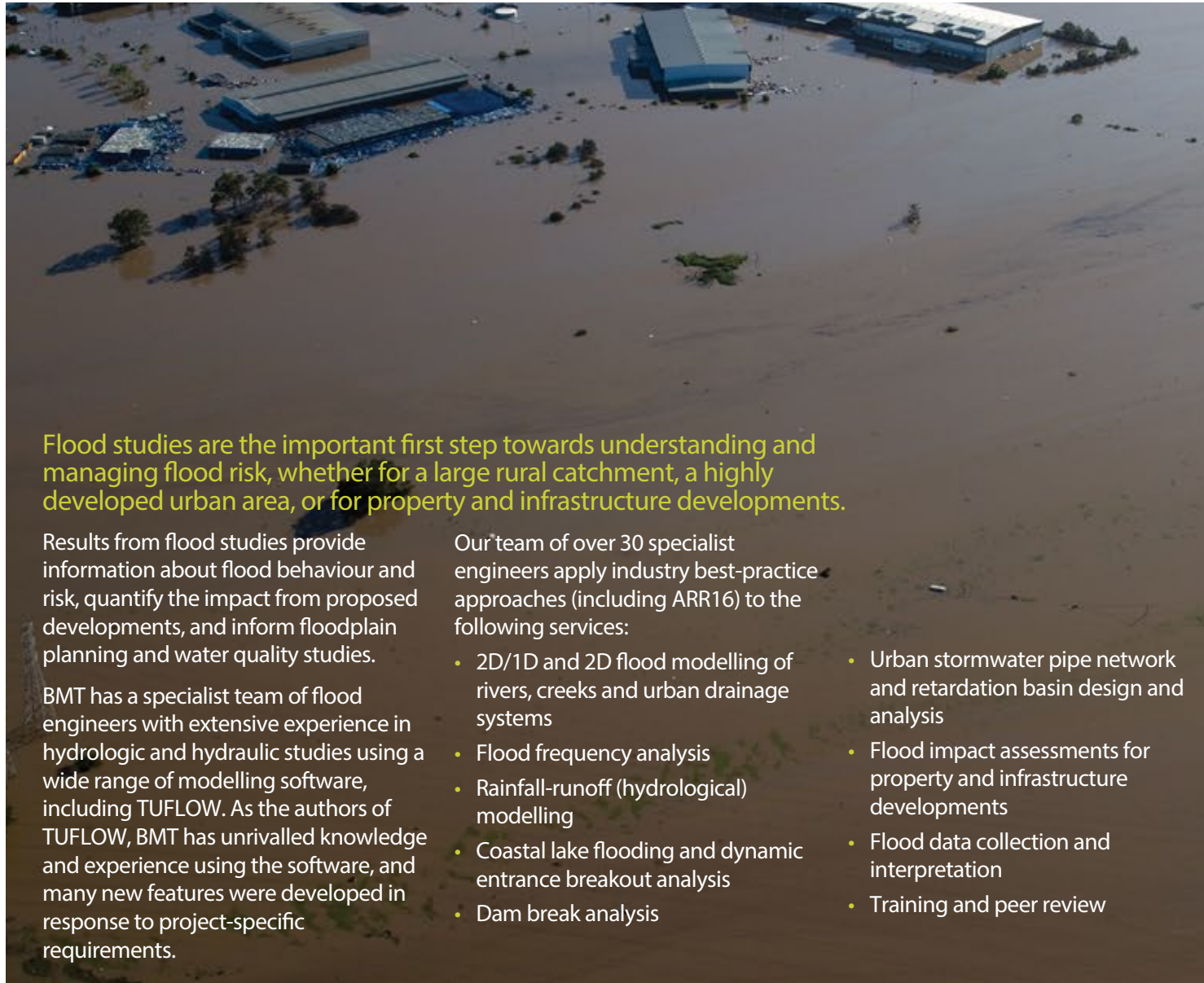
We work in unison with our clients in developing project concepts and designs that will meet environmental standards whilst maintaining project viability.

The multidisciplinary nature of our company means that most investigations can be addressed in-house. We also partner with specialist sub-consultancies to provide a 'best for project' study team.

We are experienced in carrying out environmental investigations for the private, government and industry sectors. We are able to address all aspects of the EIA process, including:

- Project scoping
- Review of legislation and policy
- Stakeholder and public consultation
- Project and environmental descriptions
- Site investigations including baseline surveys
- Impact analysis including cumulative impacts
- Development of appropriate mitigation measures
- Investigations for major infrastructure, land developments and mining/resource development projects

Hydrology and flood hydraulics



Flood studies are the important first step towards understanding and managing flood risk, whether for a large rural catchment, a highly developed urban area, or for property and infrastructure developments.

Results from flood studies provide information about flood behaviour and risk, quantify the impact from proposed developments, and inform floodplain planning and water quality studies.

BMT has a specialist team of flood engineers with extensive experience in hydrologic and hydraulic studies using a wide range of modelling software, including TUFLOW. As the authors of TUFLOW, BMT has unrivalled knowledge and experience using the software, and many new features were developed in response to project-specific requirements.

Our team of over 30 specialist engineers apply industry best-practice approaches (including ARR16) to the following services:

- 2D/1D and 2D flood modelling of rivers, creeks and urban drainage systems
- Flood frequency analysis
- Rainfall-runoff (hydrological) modelling
- Coastal lake flooding and dynamic entrance breakout analysis
- Dam break analysis
- Urban stormwater pipe network and retardation basin design and analysis
- Flood impact assessments for property and infrastructure developments
- Flood data collection and interpretation
- Training and peer review

Floodplain management

Floodplain risk management studies help Councils and the community manage flood risk, with study outcomes used to manage and mitigate existing flood risk, educate the community about flooding, improve land use planning to reduce future flood risk, and quantify the impact of future development.

Flood risk management plans developed by BMT consider economic, social and environmental perspectives and include a range of land use and management strategies.

Our flood risk management plans have a high level of acceptance from the community. BMT can offer the following specialised floodplain management services:

- Development of practical floodplain management plans
- GIS-based flood damage and evacuation capability assessments
- Options assessment for developments and structural mitigation
- Cost benefit assessments of floodplain management options
- Community survey, consultation and education
- Flood risk and emergency response mapping
- Consultation with town planners to better integrate flood controls

Flood intelligence

BMT has developed a suite of flood study add-ons to ensure that the information developed in flood studies has meaningful, real-world applications. We offer a wide range of services to help councils and emergency services relate real-time information to necessary on the ground actions, such as issuing warnings to the community, closing roads or initiating evacuations.



Flood information

BMT recognised that whilst flood studies are valuable for long-term planning, they don't always provide information in a format which can be readily used during flood events and evacuation planning. In response, we have developed a number of new TUFLOW outputs. It is now possible to map the time and duration of flood inundation, model linkages between stream height gauges and building floor levels, and identify when and where roads are likely to become inundated.

We specialise in providing information in formats which are most useful to the end user including printed and digital maps, information databases, animations and interactive websites.

Real time assistance

During flood events, emergency managers and Councils are required to synthesise a wide range of predicted and real-time rainfall and stream height data and use this information to inform flood emergency decisions. BMT are able to provide support at incident control centres by interpreting flood intelligence, advising of likely flood impacts and preparing flood warning communications.

FloodIntel

BMT built on their experience providing flood information and real time assistance to develop FloodIntel: a highly intuitive online flood intelligence system. FloodIntel is a fast, accurate and practical tool which revolutionises the way users receive, analyse and interpret flood information.



Flood warning

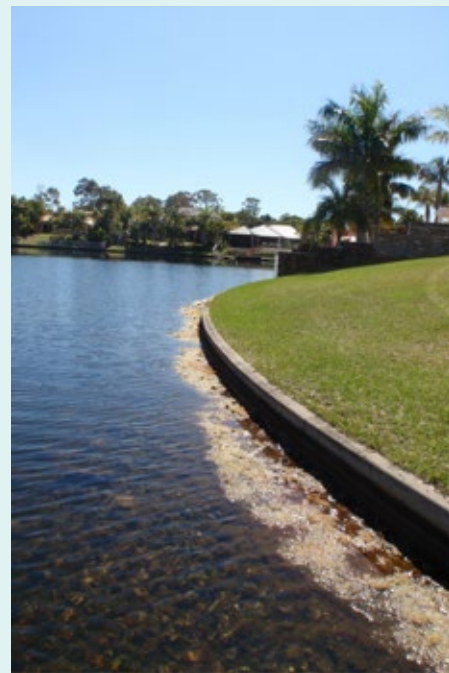
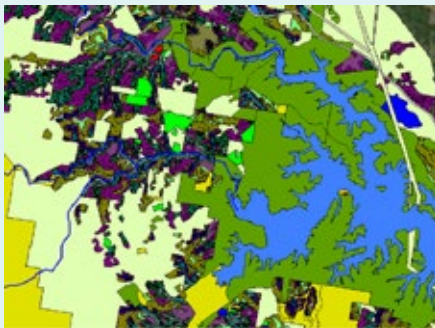
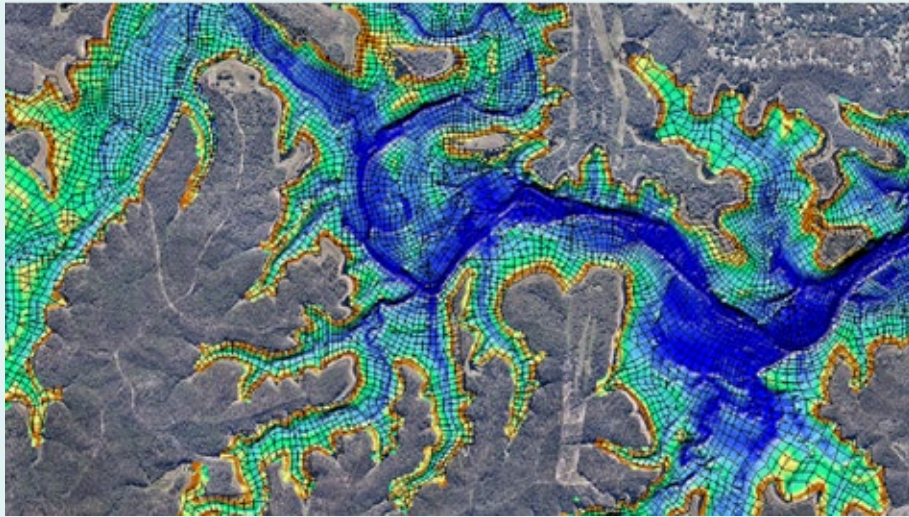
BMT is experienced in reviewing, improving and developing flood warning systems which integrate flood information and provide timely warnings to the community. Our flood warning services include review of existing gauge networks, development of relationships between gauge triggers and on the ground outcomes, and development of flood forecasting systems and integrated decision support systems (Delft-FEWS).

Water quality

Understanding the complexities of water quality dynamics and developing effective and pragmatic management strategies is our core business.

We specialise in:

- One, two and three-dimensional computer modelling of water quality within receiving waters such as lakes, estuaries, rivers and coastal oceans
- Computational fluid dynamics modelling of diffuser releases
- Associated water quality assessments within waterways relating to domestic and industrial wastewater discharges, desalination plant brine releases, and all catchment runoff
- Diffuser and pipe discharge dilution analysis, with assessment of regulatory compliance
- Assessing the relationship between water movement and exchange processes, pollutant loadings and resultant water quality in natural waterways
- Providing advice related to the remediation and management of shallow urban lakes, including the design of advanced destratification and water treatment devices
- Undertaking quantitative microbial risk assessments of drinking water supply reservoirs
- Developing and assessing management techniques to protect water quality



Climate change



Climate change is a growing concern for decision makers in all levels of government, business and industry, and for the broader community. There are significant consequences that can arise because of climate change which needs to be managed.

BMT has vast experience in the development and application of risk assessment processes and associated responses. Our multidisciplinary staff of climate adaptation experts, coastal and floodplain engineers and environmental specialists enables us to cover all bases.

Our strategic partnerships with planners and economic specialists add additional breadth to our team. We are highly skilled in overcoming the barriers between scientific complexity and users and work with clients to build their capacity and produce outputs and solutions that are fit for their purposes. We keep abreast of the latest developments in the climate risk field and bring this information to bear in the work that we do.

Climate adaptation planning

While reducing emissions is essential, climate change is still happening and will continue to into the future. Adaptation is the only practical solution and will change the where and how we live, work and play.

BMT has experience in working with clients to identify climate challenges and find short, medium and longer-term solutions. BMT keeps abreast of regulatory frameworks and government policy to ensure that we can propose options that are able to be implemented.

We have experience developing and applying climate adaptation planning guidelines and frameworks, within and outside of Australia. We have developed coastal strategies and plans using cutting edge approaches. We also develop floodplain management plans, wetland management plans, state scale plans, and plans for small enterprises.

Marine, freshwater and terrestrial ecology



Our team of dedicated aquatic and terrestrial scientists is committed to developing strategies which ensure sustainable use of our finite environmental resources.

For decades, native vegetation has been cleared and wetlands drained. With the loss of these habitats, many wildlife species have become extinct and the resultant land degradation is costing communities millions of dollars. From these actions, not only are the economy and the climate threatened, but also our future quality of life.

The way forward is to focus on sustainable land, water, vegetation and biodiversity management. This can be achieved only with long-term strategic and integrated thinking.



We are experienced in carrying out marine, freshwater and terrestrial ecological investigations.

Studies undertaken include:

- Environmental risk assessments to the aquatic ecosystem from waste discharges
- Flora and fauna species and community surveys
- Water and habitat quality assessments using biological indicators
- Design and implementation of ecological monitoring programs and associated statistical analyses
- Regional biodiversity inventories
- Coastal wetland mapping and inventories

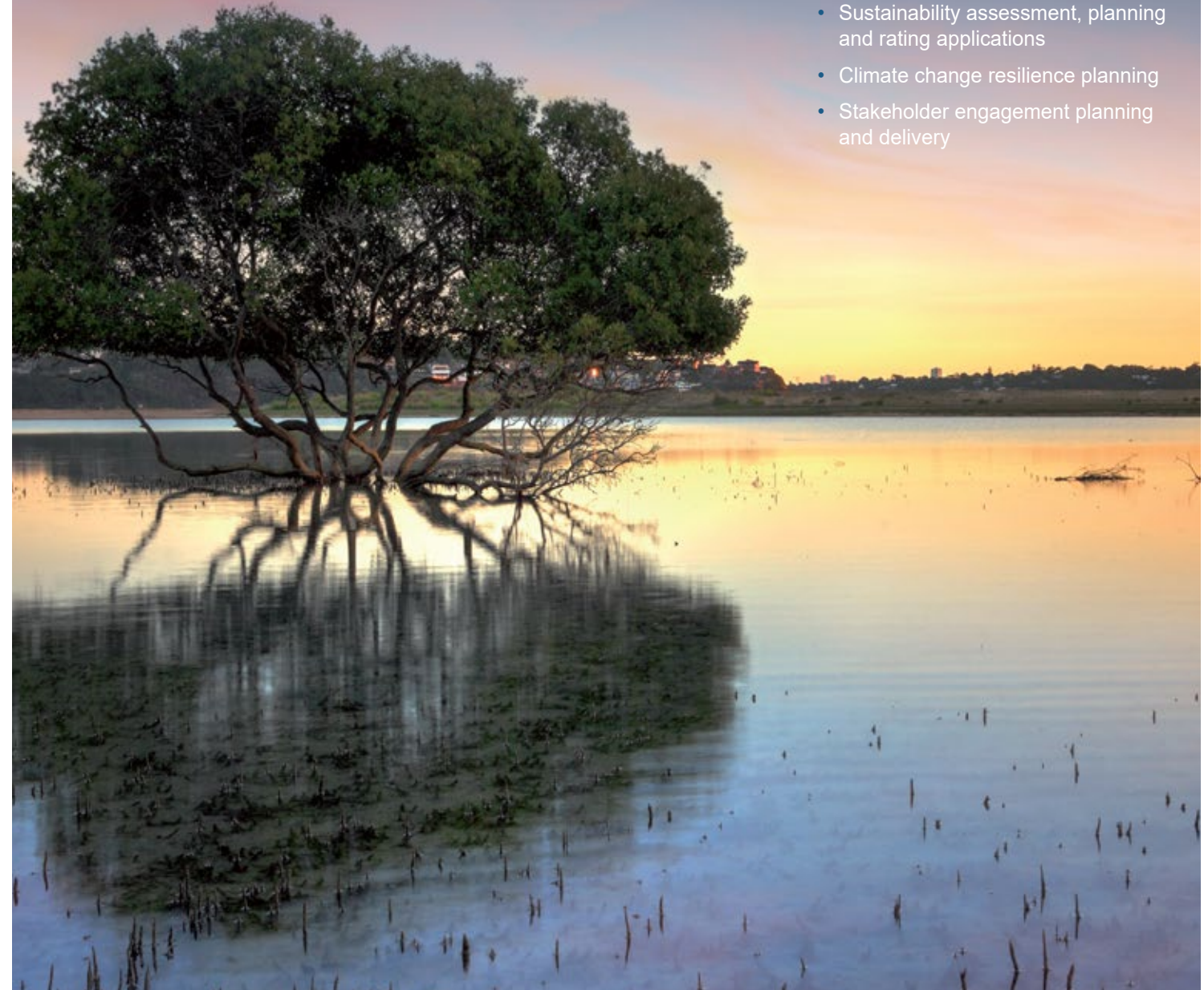
Environmental approvals and management

BMT are coastal and marine environmental management and approvals specialists. Our environment management team help clients to navigate environmental assessment, approvals and compliance processes for large and small-scale development and infrastructure projects across their full life cycle.

We work hand in hand as trusted advisors with our clients to gain environmental approvals that are timely and practical to implement. Our environmental management team is backed by strong technical experts, enabling BMT to offer innovative solutions to reducing project risk and optimising beneficial community and environmental outcomes.

We specialise in:

- Environmental and social impact assessment, with a focus on risk assessment in accordance with ISO31000 Management Standards
- Environmental approvals for both large and small-scale development projects across Federal, State and Local government jurisdictions
- Assisting with procurement processes, to ensure environmental outcomes are understood and integrated
- Environmental management plans
- Offset packages
- Environmental construction and operations compliance auditing
- Sustainability assessment, planning and rating applications
- Climate change resilience planning
- Stakeholder engagement planning and delivery



Coastal processes and management

Winds, waves and currents as well as human intervention constantly shape our coastline and influence how it is used. The challenge is to meet the increasing pressure to develop the coastal zone with environmentally sound practices, ensuring coastal processes, amenity, natural character and environmental values are protected.

BMT's highly respected team of engineers and scientists specialise in developing solutions which can satisfy the competing demands placed on the coastal zone through investigation and an understanding of the physical and ecological coastal system.

BMT is a leader in delivering:

- Numerical modelling assessments of tides, currents, waves and coastal sediment transport
- Coastal inundation hazard and risk assessments (storm tide and tsunami)
- Coastal erosion hazard and risk assessments
- Coastal climate change adaptation plans
- Shoreline erosion management plans
- The design and implementation of coastal management solutions including engineering structures, beach nourishment and sand bypassing programs
- Management of the development application and permitting for coastal management strategies

Integrated total water cycle management

To meet the needs of the environment and community, it is essential that catchments are managed as a total system.

The key is integrating the practices of flood management, water sensitive urban design, stormwater quality control, wastewater management, community needs and preservation of the natural environment.

Such integration requires the holistic assessment of water quantity and water quality issues in a whole of catchment context. Consideration and detailed understanding is required of how water behaves in such a context, including all paths whereby water passes through a catchment, encompassing surface runoff, groundwater, potable water storage treatment and delivery and wastewater collection/treatment/disposal.

We offer an integrated approach, which is crucial if total solutions to urban, peri urban and catchment systems are to be designed.

We specialise in:

- Catchment rainfall/runoff analysis
- Hydrologic assessments of changes to catchment land use
- Hydraulic flood model calibration, verification and design application
- Hydraulic impact analysis of flood management options and floodplain developments
- Urbanisation water quality impact assessments

- Design of water quality and hydraulic control structures
- Stormwater BMP assessments
- Water Sensitive Urban Design
- Integrated Urban Water Management planning
- Wastewater planning and management
- Decentralised and on-site sewage systems
- Water efficiency studies

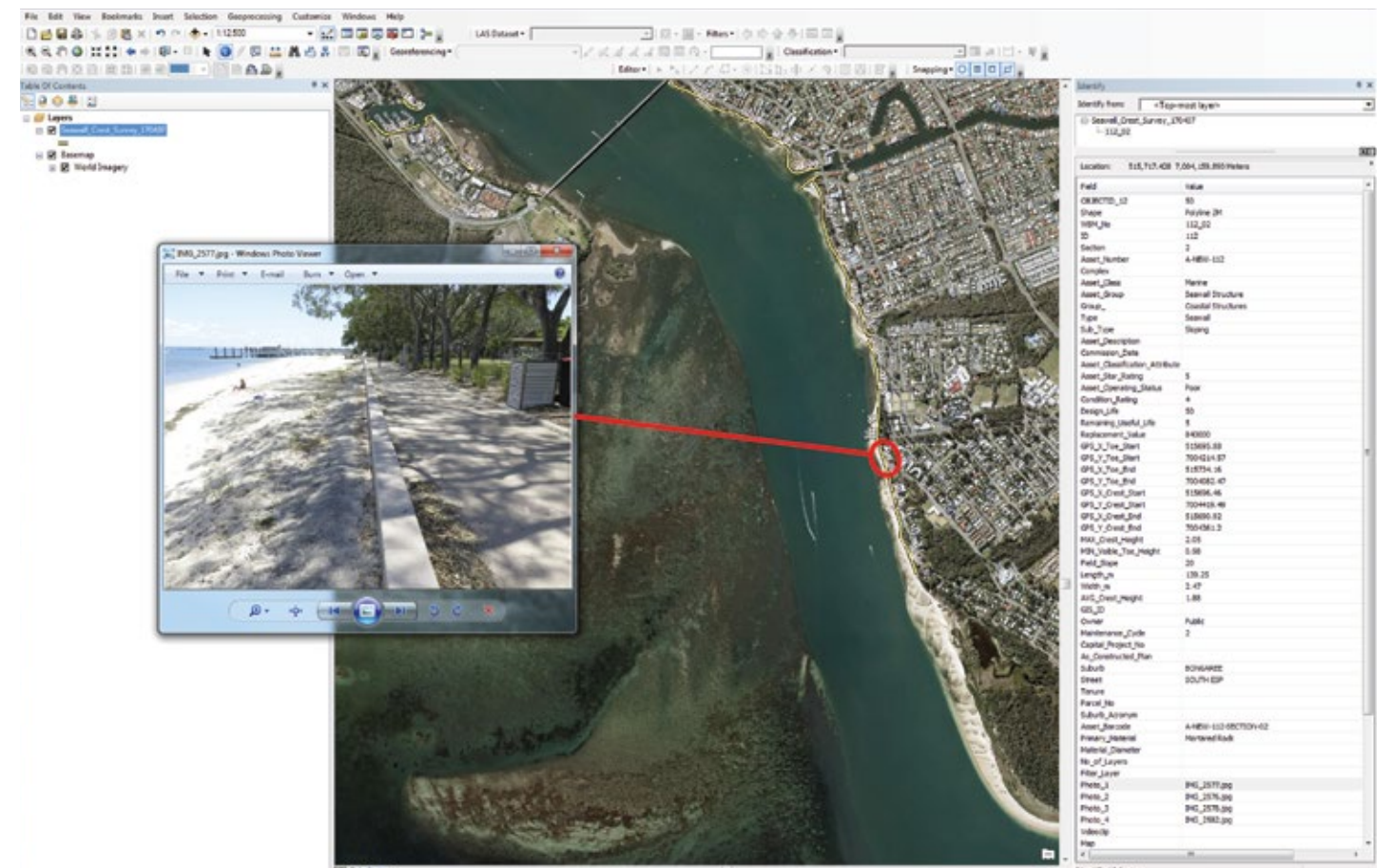
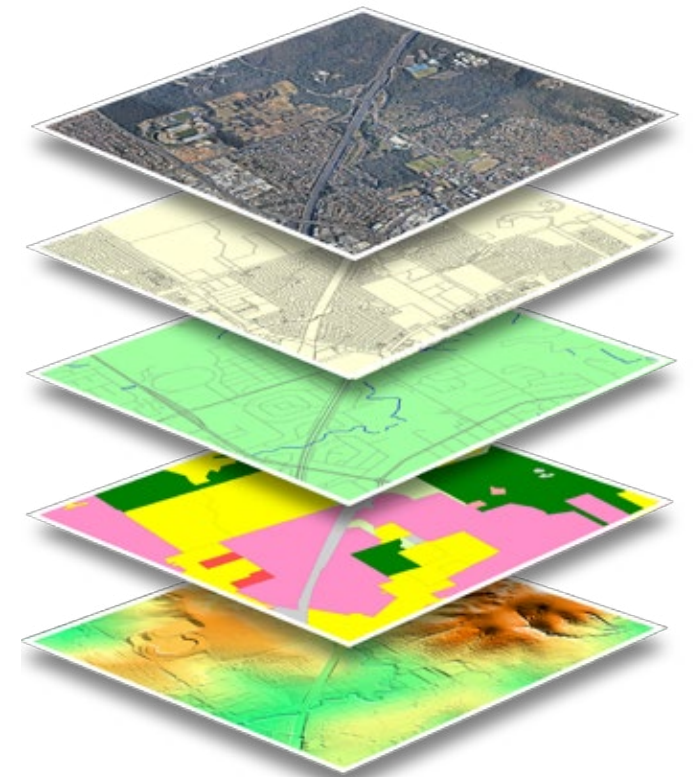
Geographic information systems and web solutions

BMT specialise in routine and advanced Geospatial analysis, and regularly utilise these skills to support our high-quality and technically advanced in-house range of disciplines. We are experienced in carrying out spatial information studies for the private, government and industry sectors.

- Flooding and stormwater management
- Flood risk management plans
- Coastal processes and engineering
- Water quality
- Environment and ecology



- High quality GIS mapping
- Interactive Web-based mapping
- GIS/CAD data capture and conversion
- Remote sensing interpretation
- Spatial referencing and image rectification
- Geodatabase design
- Webpage design incorporating links to live databases



Field data capture

BMT has a highly skilled field data capture team, supported by a full range of field sampling and monitoring equipment, together with two survey vessels and a scuba diving team certified for commercial activities.



Our field data capture team offers:

- Quality procedures to ensure that field data is collected at the highest standards
- Professional staff with over 100 years of collective involvement in environmental studies
- Design and implementation of short or longer term baseline surveys and monitoring programs
- Permanently installed instruments and those used for short term measurements of water quality, tide, flood and groundwater levels, water currents, climatic conditions and coastal processes
- Two boats, specifically designed for environmental monitoring and data capture
- Data capture suitable for subsequent computer condition monitoring, models and other uses

TUFLOW software

BMT have been developing industry leading hydraulic modelling software since 1972. TUFLOW products are used worldwide and renowned for their accuracy, usability and simulation speed. Please contact us on info@tuflow.com if you would like information on TUFLOW Classic, HPC, FM, ESTRY or our training, model review and on-demand cloud simulation services.

Common TUFLOW software applications



Catchments

Fast computing via GPU hardware for fine-scale distributed hydrologic applications and basin scale modelling.

Sophisticated options for landuse representation and a range of soil infiltration methods.



Urban drainage and stormwater

Superior 1D solver for simulating pipes, manholes, pits and lined channels. 1D links and operatable structures provide the solution for complex urban drainage, pipe networks and river systems.



Floodplains and rivers

TUFLOW's heritage, providing the benchmark modelling tool for floodplain management.

New alternatives and options with logic controls and advanced gate operations leading to flood warning and emergency response.

Flexible mesh and fast computing options.



Estuaries and river entrances

Where rivers and the sea meet; a complex interaction of tides, inflows and ocean currents combined with sediments and environmental issues.



Coastal and nearshore

Winds and waves, hurricanes, wave setup and current generation.

Longshore transport of sediments and morphological change.

Tsunami propagation and inundation.



Offshore and metocean

Providing a link between oceanography and coastal engineering with high resolution nesting and advanced 3D boundary transfers.

Supporting the oil and gas industry; oil spill response and drill mud dispersion.

BMT has a proven record in addressing today's engineering and environmental issues.

Our dedication to developing innovative approaches and solutions enhances our ability to meet our client's most challenging needs.



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