Pollution impacts, control and mitigation

Scientists at the School of Biological, Earth and Environmental Sciences (BEES) have a highly regarded international reputation in Earth sciences and ecology. BEES is at the cutting edge of current understanding of human impacts in the environment and lead the application of effective management for positive ecological outcomes and sustainability.

Competitive advantage

BEES scientists integrate theoretical and applied biology, ecology, ecotoxicology, geochemistry and microbiology to understand impacts of human activities on terrestrial and aquatic ecosystems and to provide practical solutions to environmental problems and sustainability. With have access to state-of-the-art field and laboratory equipment, capabilities include ecotoxicological (and WET) testing, pollution monitoring including emerging contaminants of concern and light pollution, invasive species surveys and management, hydro and biogeochemistry assessments, atmospheric chemistry, the characterisation of aquatic organic pollution by fluorescence, environmental risk assessment and modelling.

Impact

- Research and management frameworks are implemented by different government and industry partners.
- Research is cited in Major Project EIS documents, in State and Australian Government policies and legislation (e.g. Water Sharing Plans)
- United Nations Environment Programme (science to inform policy development on plastic pollution and greenhouse emissions)

Successful outcomes

- Research on solutions to coastal urban development are currently being implemented at several sites in Sydney Harbour, including at a substantial coastal development in Barangaroo South, Sydney Harbour.
- Guidance on compliance and monitoring for water and sediment quality guidelines and development of codes of practice.
- Technology transfer to company producing commercial fluorescent probes.
- Mapping sources and sinks of greenhouse emission, carbon accounting and carbon offsetting for science-based input for UNEP policy developments and informing the Australian Government.
- Innovative sediment remediation programs that are currently being trialled by the City of Sydney council.

Capabilities and facilities

- Modern molecular laboratories for DNA and RNA extraction and storage, PCR and RT-qPCR, gel electrophoresis, fluorescent microscopy

More Information

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- Sophisticated statistical programs and analyses including modelling (linear models, generalized linear modelling, BACI impact assessment), classification (CART, Random Forrest) and multivariate ordination (nMDS, PERMANOVA, ANOSIM)
- Advanced field data collection equipment including sub-sea positioning equipment, CTDs, boats and diving equipment
- Greenhouse Gas Measurement Laboratory - Picarro 2201-i (CH4 and CO2 isotope chemistry, LGR greenhouse gas analyser (CH4 and C02 mobile surveying and flux measurements) and LGR Isotopic N2O Analyzer
- Laboratory and field equipment to measure functional properties of organisms and/or systems (including DO loggers, PAM and incubation chambers); optical spectrometers and probes

Our partners

- Local, state and federal government
- ANSTO
- CSIRO
- Rural Research Development Corporations
- British Geological Survey
- United Nations Environment Programme (UNEP)