Isotopes for Water

Globally, water use is growing exponentially. Human activities and urban pressures are critically increasing demand on water resources, and at the same time increasing the input of pollutants into waterways. Climate change is placing an additional burden on stressed water resources and coastal systems.

ANSTO has key water research capabilities in hydrogeology, hydrodynamics, sediment and contaminant fluxes, and uptake into biological systems with a team of nuclear science, biology, hydrology, chemistry, physics, geology, oceanography and environmental engineering experts.

ANSTO Capability

ANSTO can deliver solutions to environmental problems in groundwater, coastal and surface waters, estuarine and aquatic ecosystems. Complex environmental system analysis is undertaken by tracing the pathways and fluxes of key components using environmental radioisotopes, stable isotopes and artificial radioactive and activatable tracers.

Research Snapshots

ANSTO has collaborated extensively with research communities and Government bodies responsible for the management of coasts and water resources in Australia and the Asia-Pacific region:

- Isotopic water balance of rivers and reservoirs (Sydney & Murray-Darling Basin) for water resource management
- Uptake/impact of contaminants in aquatic ecosystems - Sydney Harbour, Botany Bay, Great Barrier Reef, Fiji
- Fingerprinting (isotopic technique) nutrient and food sources to identify vulnerable species in coastal food webs
- Groundwater radiodating and aquifer definition to underpin sustainability investigations
- Contaminated sediment dynamics in urban/industrialised estuaries e.g. Homebush Bay/Sydney Harbour
- Biological indicators of pollution and baseline and historical pollution assessment
- Coastal process and sand tracing to investigate potential impacts of climate change & land use
- Particulate fluxes to coastal systems from major rivers in PNG

Commercial Track Record

ANSTO has a proven track record in applying nuclear techniques to environmental and water management problems for commercial, government and UN Agency clients:

- Groundwater dating in the Sydney Basin using radiocarbon and tritium
- Sediment and sewage tracing at ports, outfalls, dredge sites, estuaries and beaches
- Biokinetics of environmental contaminants incl. heavy metals and radionuclides in aquatic and terrestrial systems
- Ecological risk assessment using ANSTO’s world’s best practice Aquarisk code
- International experience in commercial and United Nations International Atomic Energy Agency funded studies
- Winner, 2000 Hong Kong Australia Business Association Export of Services Award

Principal Scientists

- Dr Suzanne Hollins (Project Leader)
- Dr Cath Hughes (Isotope tracing)
- Mr Ron Szymczak (Marine/contaminant tracing)
- Dr Chris Waring (Groundwater/geophysics)
- Mr John Twining (Radioecology/risk assessment)
- Dr Dioni Cendon (Hydrogeochemistry)

For more information contact:
Dr Suzanne Hollins – Project Leader Ph: +61 2 9717 3701 Email: suzanne.hollins@ansto.gov.au