**Inputs of anthropogenic nutrients and
other contaminants into coastal waters**



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**Brief bio of plenary/keynote speaker**

Martina Doblin is Professor of Oceanography at the University of Technology Sydney and current Director and CEO of the Sydney Institute of Marine Science. Passionate about the ocean from a young age, she has been a marine researcher for over 20 years, leading highly successful research teams investigating the impacts of climate change, harmful algal blooms, and more recently the ecological impacts of emerging contaminants released into coastal waters. She is a board member of Australia’s Integrated Marine Observing System, and member of the National Marine Sciences Committee, providing scientifically-robust, practical advice on marine issues of national significance to Australia. Martina has a profile of scientific and public engagement, is an advocate for diversity in the science, technology, and engineering professions, and has a strong interest in accelerating solutions for improving water quality in the urban ocean.

**Abstract**

We are currently living in the Anthropocene, an epoch when the human footprint on Earth has become so large it is being captured in the geological record. Three Earth-system processes, climate change, rate of biodiversity loss and interference with the nitrogen cycle, have already transgressed their boundaries, increasing the potential for non-linear, abrupt environmental change.

A key component of the Earth-system is the connectivity between terrestrial, atmospheric and ocean compartments. This means that anthropogenic pressures on the atmosphere cascade to the ocean (e.g. rising atmospheric CO2 causing ocean acidification), and pressures on the landscape cascade to adjacent waterways (e.g. intensive agriculture causing eutrophication), highlighting that we can’t concentrate our efforts on any one process in isolation.

In Australia, there are over 190 wastewater treatment plants that discharge treated water into estuarine and coastal environments. Additionally, there are an order of magnitude more stormwater outlets that channel untreated runoff into urban waterways. This suggests a large potential for inputs of natural and anthropogenic materials into coastal environments - for example, 66% of contaminants to Sydney Harbour are introduced via stormwater. Wastewaters are typically monitored for suspended solids, dissolved nutrients and pathogens (enterococci, E. coli), but there is growing interest in contaminants of emerging concern such as antibiotics, industrial chemicals and microplastics, because of their potential for ecological harm. Furthermore, climate extremes such as drought, flood and fires, are modulating the fluxes of materials into the ocean.

This talk will provide an environmental perspective on the management of wastewater sources in Australia, and how innovations such as valorizing nutrients as part of a Circular Economy have other considerations as part of the connected Earth-system.

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