

The Australian Microbiome Initiative - towards microbial omics at the continental scale

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The Australian Microbiome (AM) Initiative is a continental-scale, collaborative project characterising microbial diversity of Australian ecosystems on extensive spatial and temporal scales. The AM provides microbial omics data (amplicon and shotgun metagenome) linked to extensive physical, biological and chemical sample specific metadata for primarily soil and marine environments across and around Australia via a public data portal incorporating basic search and visualisation tools (<https://data.bioplatforms.com/bpa/otu/>). All data provided by the AM is methodologically standardized for sample collection and processing, and data acquisition and analysis. We will discuss the AM with respect to marine microbial data. Long-term time series investigating marine microbial diversity are scarce, particularly in the southern hemisphere. Over the last decade, the Integrated Marine Observing System (IMOS) have sustained temporal (monthly) observations, at up to 6 depths, of many oceanographic parameters at seven National Reference Stations (NRS). These NRS represent several important marine biomes around Australia's coastline. Since 2012 these observations have included microbial omics data, which form a core component of the AM. Since 2018 we've been collecting coastal omics and metadata from a range of coastal environments (pristine to impacted, temperate to tropical) with the aim of integrating microbial omics data to constrain and validate ecosystem and biogeochemical process models. The AM omics and environmental data provide a crucial spatial and temporal scaffold for understanding Australian marine and coastal microbiology which in turn underpins long term observations on the status and trends of oceanic and estuarine health for environmental managers and regulators.