Improvements to water quality monitoring through the inclusion of ocean colour products correlated with in-situ water quality gradients for the Great Barrier Reef

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There has been a well-recognized link between declining water quality and the ecological health of coastal ecosystems for the Great Barrier Reef (hereafter GBR) .A strong driver of water quality change in the GBR is the pulsed or intermittent nature of terrestrial inputs into marine coastal ecosystems. Delivery of potentially detrimental terrestrial inputs–freshwater, sediments, nutrients and toxicants typically via flood plumes will be exacerbated under modelled climate change scenarios and presents an on-going risk to the resilience and survival of inshore GBR ecosystems. The consequence of changing weather and degraded water quality has had profound impacts on the Queensland coastal area, but may also be the driver of large scale reported decline in the many inshore seagrass systems and coral reefs, with concerns for the recovery potential of these impacted ecosystems if extreme weather events become more frequent. The influence of extreme weather conditions will be presented in context of wet season water quality data collected within the Great Barrier Reef Marine Monitoring program, including the spatial and temporal extent of the water quality conditions as measured by in-situ sampling and satellite imagery, particularly through the use of ocean colour correlated with water quality gradients.

Effective management of the coastal zone in the Great Barrier Reef is of particular importance in light of the recent UNESCO report on coastal pressures in the GBR and the potential to place the GBR on its "World Heritage in Danger" list. Current water quality management needs of the managing authorities rely upon both remotely-sensed and in situ data.   Existing remote sensing products require significant interpretation to successfully describe various water quality parameters at reef locations. Ongoing work also includes the modelling of river contaminants, such as suspended solids (TSS) and particulate nitrogen (PN) validated with MODIS derived products. These MODIS products have proven valuable for quantifying the effects of river plumes on seagrass and coral reef habitats. Eventually, we hope to integrate MODIS products with model tracers, enabling us to predict how MODIS derived plumes will change under different catchment management strategies