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Presentation Title: Preliminary Survey of the Nutrient Discharge Characteristics of Okinawa Rivers, and their Potential Effects on Inshore Coral Reefs

The 2nd Asia Pacific Coral Reef Symposium was held on June 20–24, 2010 in Phuket, Thailand, with the theme: “Collaboration for Coral Reef Conservation in a Changing Climate”. The symposium covered many topics including disturbances on coral reefs, reef monitoring and assessment, diseases on coral reef, Biology, ecology and biodiversity of coral reefs. In this conference I participated in listening to oral presentations from keynote speakers regarding Coral reef conservation, biodiversity and management. I also gave a poster presentation under the mini symposium “ disturbances on Coral reefs” to introduce my research findings summarized below.

Abstract: Excess nutrient discharge from rivers has negative impacts on coral reef ecosystems. On Okinawa Island, the reefs that are particularly at risk from changes in nutrient levels are those in inshore regions, especially those close to river mouths. In this paper, we present the results of a preliminary survey of water quality and nutrient (ammonium, nitrate, and phosphate) data collected from river mouths on Okinawa Island in December 2009 and January 2010. The water quality results were correlated with human population density within the catchment and with previous reef-edge coral cover survey results for Okinawa Island.

The water quality results showed that nutrient concentrations were above threshold limits for the healthy growth of corals. Elevated nutrient concentrations were recorded from most southern rivers and from some rivers in central and Motobu peninsular areas. Most northern rivers exhibited very low nutrient concentrations. The results imply that spatial variations in nutrient concentrations are mainly influenced by human activities within the catchment, as proven by strong positive correlations between inorganic nutrient concentrations and human population density. For southern and central rivers, nutrient concentrations were strongly correlated with coral cover. However, this relationship was not significant for northern rivers, indicating that apart from inorganic nutrients, other environmental stressors affect the health of the inshore coral reefs of Okinawa Island. The decline of the reef has been repeatedly noted during the last decade. It is likely that reef condition may deteriorate further as nutrient loads increase due to rapidly increasing land clearance for agriculture and coastal development. To monitor further developments in nutrient distribution from Okinawan rivers, to investigate the influence of these nutrients on coastal coral reefs, and to establish causal relationships, long-term investigations are strongly recommended.

Key words: Rivers, Nutrient discharge, Coral reefs, Okinawa,