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Assessment of human activities impact on groundwater quality discharging into a reef lagoon

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The Eastern coast of the Yucatan Peninsula has the fastest growth rate in Mexico and groundwater is the only source of drinking water in the region. The consequences of the lack of proper infrastructure to collect and treat wastewater and the impact of human activities on the quality of groundwater are addressed. The groundwater in the coastal aquifer of Quintana Roo (SE Mexico) discharges directly into the ocean (Submarine Groundwater Discharges). In addition, the coral reef of the Eastern Yucatan Peninsula is part of the Mesoamerican Coral Reef System, one of the largest in the world. The interaction of the reef-lagoon hydraulics with the coastal aquifer of Puerto Morelos (NE Yucatan Peninsula), and a major input of NH4, SO4, SiO2, as a consequence of the use of septic tanks and the lack of modern wastewater treatment plants are presented. A conceptual model of the coastal aquifer was developed, in order to explain how the human activities are impacting directly on the groundwater quality that, potentially, will have a direct impact on the coral reef. The protection and conservation of coral reefs must be directly related with a policy of sound management of coastal aquifers and wastewater treatment.