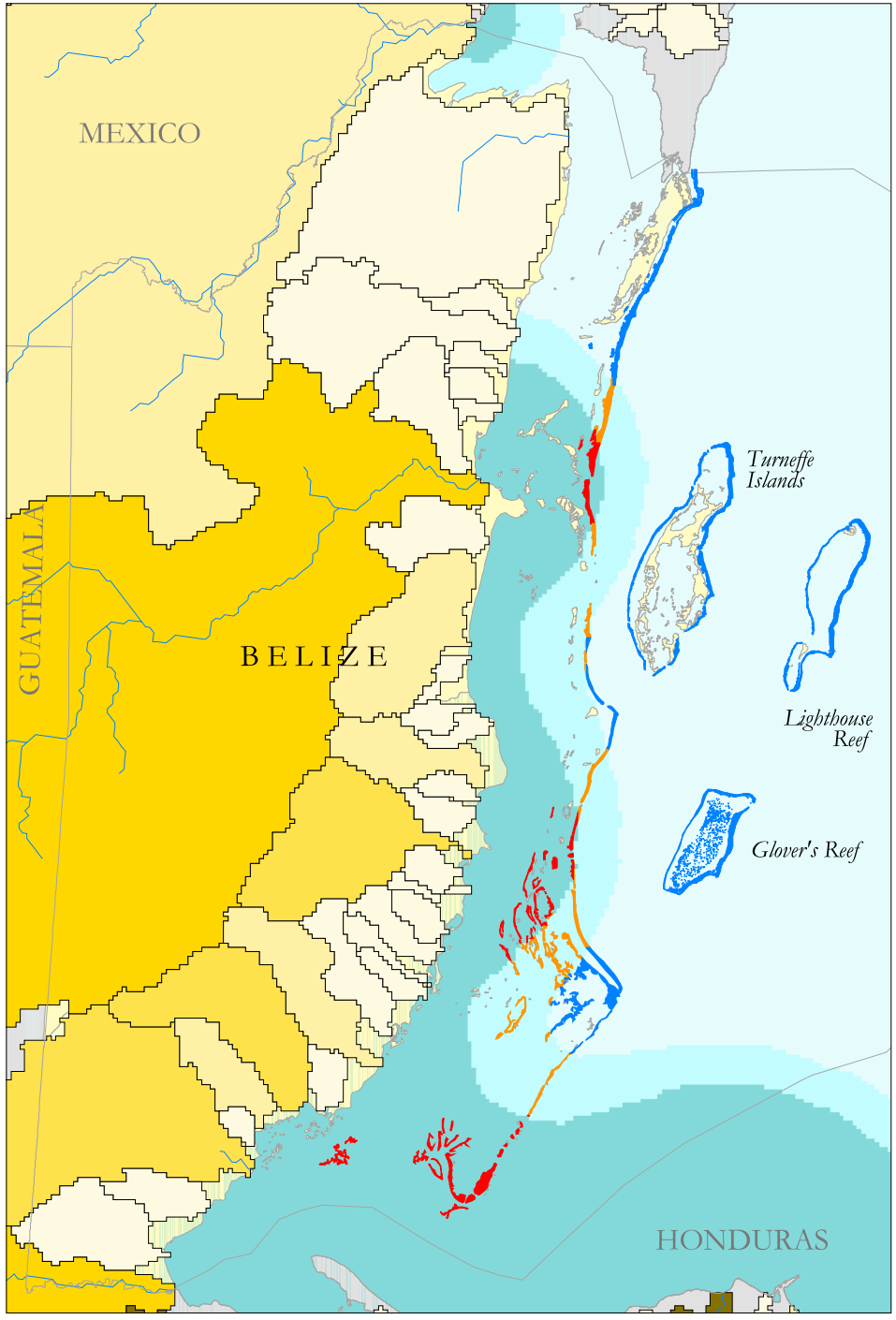
Agricultural Runoff - Watersheds and Modeled Sediment Delivery



Map Projection: UTM, Zone 16, NAD1927

Agriculture and other land use activities far inland can have an adverse impact on coral reefs through the increased delivery of sediment and pollution to coastal waters. Watersheds are an essential unit for analysis, since they link land areas with their point of discharge to the sea. A watershed-based analysis of land-based sources of pollution (LBS) was implemented at 1-km resolution to develop a preliminary estimate of this threat. This analysis incorporates land cover type, slope, soil characteristics, and precipitation in order to estimate relative erosion rates for all land areas. These estimates are then summarized by watershed, allowing for estimation of relative sediment delivery at the river mouths, which is being used as a proxy for both sediment and pollution delivery. Sediment plumes were estimated on the basis of relative sediment delivery and distance from each river mouth. Areas of elevated sediment threat are large, reaching reefs off of Punta Gorda, the Sapodilla Cayes, and many segments of the Belize Barrier Reef. This modeling of threat from agriculture produces results similar to those from the expert mapping of threat from agricultural runoff.

Relative Sediment Delivery by Watershed
- Low
- High

Reefs by Land-based Sediment Threat
- Low
- Medium
- High

Threat from Land-based Sources - Modeled
- Low
- Medium
- High

- National Borders
- Major rivers
- Belize Maritime Boundary

Data Sources: Modeled threat to coral reefs from watershed-based sources of sediment and pollution from the "Reefs at Risk in Belize" analysis, World Resources Institute (WRI), 2005. Watershed boundaries from the "Reefs at Risk in the Caribbean" analysis, WRI, 2004. Rivers from USGS, HYDRO1k, 2000.

Reefs at Risk in Belize

A collaboration between the World Resources Institute, Belize Coastal Zone Management Authority and Institute, and many other partner organisations in Belize. Datasets available on the Belize Coastal Data CD (email datacen@coastalzonebelize.org for more information).