

Stressor (Threat) Indicator Ranking Results							
Healthy Reefs for Healthy People							
Indicator	Overall Indicator Ranking				Caveats/ Limitations	Data gaps	Comments
	Ecological relevance	Feasibility	Limitations	Responsiveness			
Biomarker (Triclosan and Chlost.)	High	Moderate	Low	Moderate	Can be expensive, however dip sticks are in development		ELISA Assays
Coastal development Index	High	High	High	High	Establish Land Use Plans	Enforcement/Policy	Use the "Reefs at Risk" Coastal Development Threat Index
Conch/lobster abundance data	High	High	High	High		FAO lobster working group and Jaime Gonzalez for lobster benchmarks and targets	
Coral damage Index	High	High	Moderate	High			Jameson et al. 1997; linked with community structure
Density/mean length fish species	High	High	Moderate	High	Can we develop a trophic structure from fishery to evaluate the health? Index of trophic structure	Expand this technique into mangroves and seagrasses	Validated; Target a few specific serranids, lujanids, scarids and acanthurids and develop benchmarks and targets for these PLUS trophic index
Extent of Bleaching and Bleaching Mortality	High	Moderate	High	High	Could be expensive for large areas		Need standardized approach for evaluating coral bleaching extent over large areas (Lang 1992 or GBR Method) - possibly include in benthic surveys
Fishing Dependent Methods	High	High	Moderate	High	Can we develop a trophic structure from fishery to evaluate the health? Index of trophic structure		Catch/effort lobster, conch, shrimp, finfish sp. # boats; Gear type/port Should we use the "Voice of the Fishermen" type regional study?
FORAM index	High	High	Moderate	Moderate	requires some training on identification of forams; decadal response		Assessment tool to evaluate current community structure not a monitoring - integrated signal over many years
FORAM Photo Stress Index	High	High	Low	High	Indicative of Photo Stress. FORAMS bleach before corals due to photo stress, but are not as susceptible to temperature stress.		
Molecular Biomarker System	High	High	Moderate	High	technology and costs - Requires tools and competent technician	research in progress	Effect - should be targeted to suspected areas of stress; Infrastructure needs development; Overall, moderately useful; depends on the question you are asking; 2nd tier indicator
MPA effectiveness	TBD	TBD	TBD	TBD			*Monitor fishing independent indicators in and out of marine reserves/no take zones
NOAA Temperature Hotspots	High	High	High	Moderate	is indicative of areas that might bleach.		Add other sensor (modis, etc.) - ocean color and water transparency - should be kept on same website
Photic (Amphi) Index	High	High	High	High	requires some training on identification of forams		Not fully published
Population movement	Moderate	Moderate	Moderate	Moderate	Organisms could be moving for a variety of reasons		
Reproductive deformation	High	Moderate	Moderate	Moderate	More than TBT		

Satellite Imagery (plumes, etc.)	High	TBD	TBD	High	Need remote sensing specialist to evaluate feasibility/limitations		Runoff plumes should be monitored and included in "hotspot" data/website
Sediment accumulation of pollutants*	High	High	High	High	300 g mud; relatively expensive; technology improving	* Recommend using accumulation in sediments instead of bioaccumulation	Cause: If an effect is observed with MBS a cause (contaminant) should be sought; Focus on commonly used chemicals of region: endosulfan, DDT, paraquat
Sedimentation rates	High	High	High	High	Muddy sediment vs. Resuspended sands grain size analysis		Recommend measuring sedimentation and resuspension; use in conjunction with water transparency
Spawning Aggregations	High	Moderate	Moderate	High	Watch out for migration	Not enough sites; New Technology: Spawn-o-meter (Phil Lobal); SONAR	MBRS Monitoring Protocol finished and soon available. # aggregations/100 km of reef identified; sizes and numbers
Tourism Index	High	High	Moderate	Moderate	Establish Land Use Plans	Density; Enforcement/Policy	Normalize # hotel rooms/km coast or # visitors (typical)/km coast

This file is a working draft from the Healthy Reefs workshop, Miami, June 2004.

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