

2016 Eco-Audit of the Mesoamerican Reef Countries

Are we doing all we can to safeguard our most valuable natural asset?

The Mesoamerican Reef (MAR) provides a diverse array of valuable goods and services to the people of Belize, Guatemala, Honduras, and México. The leaders of these four countries, officially recognized their shared vision and commitment to conserving the >1000 km of coral reef in the Tulum Declaration of 1997, followed by the 2007 declaration of March 10 as “Mesoamerican Reef Day”.

Today, we celebrate Mesoamerican Reef Day 2016 by **recognizing** our partners in our collective progress in protecting this valuable resource and **identifying** priority management actions still needed to safeguard our reefs for future generations.

Over the last 10 years the Healthy Reefs Initiative has published four *Report Cards* on the Health of the Mesoamerican Reef. These reports have described a mixture of declines and recovery in coral reef health. The declines stem in part from inadequate management of local pressures and threats. The purpose of the 2016 Eco-Audit is to **catalyze** faster, more effective management responses and to **increase** accountability within the public and private sectors, and among non-governmental organizations (NGOs).

What is an Eco-Audit?

The Mesoamerican Eco-Audit **evaluates** our collective efforts toward protecting and sustainably managing the region’s coral reefs, **celebrates** management success stories, and **documents** the extent to which recommended management actions have been implemented in Belize, Guatemala, Honduras and México. The Healthy Reefs Initiative (HRI), in collaboration with the World Resources Institute (WRI) and local partners, developed this unprecedented multinational evaluation tool of reef stewardship in 2011. The Eco-Audit is a systematic and transparent evaluation of the degree of implementation of 28 recommended reef management actions, grouped into seven general themes: Marine Protected Areas, Ecosystem-based Fisheries Management, Coastal Zone Management, Sanitation and Sewage Treatment, Research, Education and Awareness, Sustainability in the Private Sector, and Global Issues. This 2016 Eco-Audit is our third evaluation, enabling us to consider trends and rates of implementation in addition to the comparative scores for implementation by each country.

How is it Scored?

The Eco-Audit analysis is objective, science-based, and validated. The financial and management auditing firm of PricewaterhouseCoopers Costa Rica (PwC) provided verification of the initial Eco-Audit method, indicators and criteria in 2011. The 2016 Eco-Audit analysis draws on input from a variety of NGOs, governmental agencies, and the private sector, and includes transparently verified and publicly available results. The 28 standardized management indicators were assessed on a five point ranking criteria evenly applied in all four countries during the annual 2015 regional partners meeting. The documentation materials were verified by an independent international expert and available at www.healthyreefs.org. HRI and its regional partners are committed to maintaining audit standards that are unbiased, fact-based, transparent, and replicable.

What is the Overall Score for the Mesoamerican Region?

The overall 2016 score for the Mesoamerican Region was 62%, which is an improvement in the implementation of recommended management actions compared to 54% in 2011 and 57% in 2014.

The highest scoring management theme was Research, Education and Awareness (88%); the lowest scoring was Sanitation and Sewage Treatment (47%). Improvements were measured in every theme except Sewage and Sanitation.

Since 2008, over 62% of the 28 indicators have been implemented to some degree. Three of the 28 indicators have been fully implemented including: The Indicator 1a. Percent of each country’s maritime

are inside MPAs, with the MAR protecting >20% of its territorial sea was achieved in 2014; the Indicator 5a. Standardized monitoring and reporting was fully implemented, due to the availability of the regular regional assessments of reef health and the openly available online database in 2016, and Indicator 5c. Understandable information on reef condition, threats and values, available to the general public and stakeholders.

Belize maintains its leading role of the four countries in implementing reef management recommendations - with 68% implementation overall, followed closely by México (64%), Honduras (60%), and then Guatemala (54%).

Collaborative Achievements in the Region

- The MAR has protected >20% of its territorial seas, more than most other areas
- Five new MPAs have been designated since 2011
- Fully protected (no-take) areas have increased to 3%, but needs to increase more
- Fully protected areas had 10 times more snapper and grouper
- Protection and gear restrictions have resulted in more large groupers and parrotfish
- Parrotfish now fully protected in Belize, Guatemala and the Bay Islands, Honduras
- Collaboration at the governmental level has increased with all 4 countries
- Regular standardized coral reef monitoring conducted every 2 years
- Open-access online interactive database of all coral reef monitoring data

Themes with “Good” Scores

Research Monitoring and Education has been a mainstay of the non-governmental organization’s (NGO) effort in the region and is a necessary component of understanding and improving reef health. This year, it remains the theme with the highest score of 88%, based on effective monitoring, data sharing and communication with two indicators fully implemented in 2016. Areas that need further development include assessment of coral reef economic values (Belize has had economic valuation study) and development of partnerships that integrate social and ecological research.

Marine Protected Areas are one of the main tools for protecting reef resources in the MAR. This theme had the second highest score (70%), based partially on the amount of area under protection. Improvements were seen in the amount of areas fully protected and the generation of alternatives for fishers within the network of MPAs. These replenishment zones are important to allow fish to mature and produce more fish for the future. Based on HRI data of 43 long-term survey sites, fully protected areas had 10 times more snapper and grouper biomass than those within general areas of designated MPAs or reefs with no protection. More large groupers were found in long-established MPAs or MPAs with additional protection measures. Progress is still needed in the level of “MPAs with good enforcement”; highlighting the importance of fully funding MPAs, providing staff and training to implement MPAs, and increasing enforcement of regulations within the MPAs.

Themes with “Fair” Scores

Ecosystem-based Fisheries Management promotes long-term ecological integrity and fisheries sustainability benefiting reefs and people. It has a fair score (60%) due partially to previous improvements in 2014 such as (2a) Harmonizing fisheries regulations among countries, and improving (2b) Grouper fishery regulations. New improvements in 2016 are based on the increased protection of parrotfish and grazers with full protection in Guatemala (5-year harvest ban) and new efforts in México. Efforts to protect parrotfish are important especially as parrotfish are being targeted for food as other fish stocks decline. Previous efforts to protect herbivorous fish has resulted in an increase in biomass over the years with more large parrotfish found in MPAs or catch restrictions, suggesting protection allows parrotfish to grow large. Additional progress is needed to address rights-based sustainable fisheries management. Recovery of fisheries requires the appropriate management of fishing areas and practices, as well as efforts to identify and address underlying social and economic factors leading to overharvesting.

Coastal Zone Management (CZM) is considered one of the most critical management needs within the region, balancing the need for economic development, sustainable livelihoods and long-term ecological sustainability. The 2016 CZM score improved to 60%, with some progress in all four countries with their coastal zone and watershed management plans. Further actions are now needed to further implement and enforce these management plans, especially to address direct physical damage through dredging or land filling, or indirect damage through increased runoff of sediment, pollution, and sewage, all of which can greatly impact the health of a reef. Additional effort is also needed to track the extent of mangroves affected by these plans.

Global Issues include ratification of international treaties and adoption of climate change programs on national scales. This had no progress in 2016 and remains at 56%. In an effort to reduce HRI's own carbon footprint, the Eco-Audit is being published as an interactive online resource instead of paper copies. Progress started in 2015, and to continue, this year includes a new regional Coral Bleach Watch effort to address Indicator 7a. Research to identify and map reefs most likely to be resilient to warming seas / coral bleaching. Last year, partner teams quickly responded to the Coral Bleach Alert and surveyed reefs across the region to identify areas affected by the increased sea surface temperatures.

Themes with “Poor” Scores

Sustainability in the Private Sector seeks to evaluate how much the private sector, who benefits from the regions coral reefs, are contributing back to their management and conservation. It had a very slight improvement and ranks at 50%. The most progress has been indicators for the level of governmental incentives given to sustainable businesses, adoption of seafood eco-labeling programs and voluntary eco-standard programs for marine recreation providers. Additional efforts are needed to increase the participation of hotels in eco-certification schemes and support of MPAs by the private sector. Partnerships between the private sector and governments or NGOs can facilitate information exchange, training in best environmental practices, and collaborative efforts to find solutions to issues of shared concern.

Sanitation and Sewage Treatment is a key issue for protecting both reef health and human health. This is the lowest scoring theme (46%) with no improvement this period. Inadequately treated sewage is commonplace in the region and deleterious to both. These indicators explore the extent to which regional standards for wastewater management and sewage treatment have been developed, adopted by countries, and applied to the construction of new sewage treatment infrastructure. However, solid efforts are underway to address these issues, particularly in Honduras and México. Additional efforts are needed for new infrastructure to treat and reduce wastewater (including sewage and industrial effluent) in order to reduce the nutrients and toxins that reach coral reefs.

Three Indicators Fully Implemented

Global Leader of Marine Protected Areas (MPA)

Globally, scientists have estimated that between 20–40 percent of the sea should be protected in order to be effective. The Indicator 1a. Percent of a country's territorial sea included in gazetted MPAs is calculated as Area of MPAs (marine area only/Area of territorial sea) X 100 and verified through designated geospatial boundaries. In 2014, this indicator had a ranking of 5/5 based on the criteria of “at least 20 percent of territorial sea is inside MPAs”. The MAR retains its global position as a leader in MPA declaration – all four countries have achieved the target of protecting 20% of its territorial sea. The 45 MPAs in the MAR protect 23,492 km² of marine area. Over 7% of that marine area is under full protection, including large areas in Banco Chinchorro and Swan Islands. Five new MPAs have been designated since 2011, including a new community supported MPA in Tela, Honduras and an expansion of Hol Chan Marine Reserve from 55 km² to 441 km².

Solid Science Strengthens Management and Conservation Effectiveness

The number of decision makers in the MAR that understand reef ecosystems, threats, values, and management approaches has greatly increased in recent years. This knowledge has provided tools to better understand reef condition, recognize problems, address threats, and gain political, financial and public support for reef management and conservation.

In 2016, Indicator 5a. Standardized monitoring and reporting had a ranking of 5/5 based on the criteria of “*a regional standardized monitoring program of coral reef health and a database with routine, up-to-date, and representative data both exist measures the efforts of researchers and managers to standardize monitoring methods, apply them in regular monitoring of representative sites, and share the information in a publicly accessible and up-to-date database*”.

The Mesoamerican Region is one of the few regions to collect long-term data across multiple countries with multiple groups. The Healthy Reefs Initiative, in collaboration with 70 partner groups, monitors 1000 km of coral reef across 4 countries every 2 years, all with one compatible scientifically rigorous method. Our first surveys were in 2006 of 326 sites (that is about 1 site every 3 km); additional surveys were done in 2008, 2010, 2012, and 2014. In 2016, we will collect year “10”.

The completion of the Healthy Reefs online database last year marks an important milestone, now enabling large scale scientific analysis of the data in ways that can advance the global community’s understanding of how coral reef ecosystems function, and how we can most effectively reduce the main stressors and improve ecosystem health. The database contains over 1000 entries, with >100,000 of records of corals, fish, and key invertebrates. The data portal greatly improves the efficiency, transparency and reliability of data compilation and analysis. It is enhancing the sharing and utilization of data and numerous new peer-reviewed publications have been published.

The data is also contributing to better management actions and decisions including: *Education and Advocacy* - HRI Report cards and indicator data have provided the much needed scientific basis to increase advocacy, outreach and education on the key issues impacting reef health. *Marine Protected Areas* - HRI data are being used in refining and creating MPA management plans (Banco Cordelia, Honduras, Punta Manabique, Guatemala and Turneffe, Belize; Limones Reef, México). *Fishing Regulations* - HRI data was the foundation for encouraging regulations to protect parrotfish in Belize, Honduras’ Bay Islands and, just last year, Guatemala. *Solid Science* - Providing easier and better access to more detailed reef health and biodiversity data supports those studying marine science at all levels, from scientists to students.

In 2016, Indicator 5c. Understandable information on reef condition, threats and values, available to the general public and stakeholders had a ranking of 5/5 based on the criteria of “*documents presenting scientific findings on coral reef condition and threats geared toward a general audience are widely available (print, television, social media, radio, and online)*”. Over the past two years, HRI and partners have increased effective communication through the regular use of various media outlets (website, TV, newspapers, social media, etc.) in the MAR and to the global marine conservation community. HRI Report Cards and indicator data have provided the much needed scientific basis to increase advocacy, outreach and education on the key issues impacting reef health.

Country Scores

The rankings by country remain unchanged from the previous two assessments, with Belize (68%) demonstrating the fullest implementation followed closely by México (64%), Honduras (60%) and Guatemala (54%). Interestingly, Honduras had almost twice as many conservation action improvements (9) as the other countries (México and Guatemala with 5 and Belize with 4).

In 2016, all 4 countries improved in two regional indicators making it three fully completed actions within the Eco-Audit for 5a. Standardized open monitoring database and 5c. Creating understandable

information on reef health (joining 1a. Maritime area within MPAs which was achieved in the 2014 Eco-Audit).

Belize

Belize had the highest score of 68% and has implemented several management actions in the past to improve Marine Protected Areas and address Global Issues. There were increases in four indicators.

The biggest progress in 2016 was for two indicators in Coastal Zone Management including Belize Cabinet's approval of the CZM Plan (3a) and ERIs completion of watershed management plans (3b). Effective, integrated coastal planning emphasizing sustainable development, alongside enforcement of coastal development regulations, can greatly reduce the pressures of coastal development. However, having a well-designed coastal zone plan is only the first step toward achieving successful coastal zone management. The next important step for Belize will be the effective implementation and enforcement of these plans.

Also new this year was progress on their efforts in Marine Protected Areas to improve 1f. Alternative livelihoods for fishers within MPA networks. A long history of open-access fishing has negatively impacted Belize's reef health because it encourages overfishing, illegal fishing, and a lack of stewardship. Giving fishermen a stake in their fishery through a process called "Managed Access" (MA) provides them better fishing opportunities while also allowing fisheries to recover. Recent efforts to establish managed access in Port Honduras Marine Reserve (PHMR) and Glover's Reef Marine Reserve (GRMR) is helping to rebuild fisheries by empowering fishermen to be stewards of their resource (led by Belize Fisheries Department, Wildlife Conservation Society, Toledo Institute for Development and Environment, and Environmental Defense Fund).

México

México had a score of 64% which included increases in 5 indicators and the inclusion of 3 new scores that had not been ranked before, making this the first complete evaluation for Mexico. México has the highest scores in 2016 for the themes Marine Protected areas and Coastal Zone management of the 4 countries, and also made progress in Ecosystem-based Fisheries and Research, Education and Awareness.

For Marine Protected Areas, significant progress was achieved for 1b. Percent of a country's territorial sea included in fully protected zones. A new fish refuge established in Akumal raised the percentage of territorial sea fully protected to 4.1% and doubled the indicator score from 40% to 80%. While MPAs in general offer a variety of conservation measures, fully protected reserves like the one in Akumal provide the maximum benefits, allowing the replenishment of fisheries and restoration of ecosystem balance.

For Ecosystem-based Fisheries Management, scores improved for 2c. Protection of key grazers based on their new efforts in science and outreach. This indicator measures the degree of protection for parrotfish—the most significant family of herbivorous fish who keep algae from overgrowing corals. A new multidisciplinary working group was formed to address the state of parrotfish protection in México, implement scientific studies and create new educational outreach about the important role of parrotfish in reef health.

For Coastal Zone Management, México made progress in 3b. Watershed management plans related to coastal zone planning. An integral watershed management plan that covers at least 50% of the watershed area of Q. Roo was developed by the Geological Services of Austria, the Technical University of Denmark, the Neüchatel University and Amigos de Sian Ka'an; and new studies to create a geo-hydrological reserve in Northern Quintana Roo, raising this indicator from 40% to 60%. Effective, integrated land use planning inside the watersheds in México is essential to preventing erosion, sedimentation, and nutrient pollution into coastal and marine waters. In particular, nutrients damage

reefs and benthic ecosystems. The new watershed management plans include requirements for appropriate land use practices and water quality standards.

For Research, Education and Awareness, México improved its score for indicator 5d. Development of socio-ecological research with the inclusion of multidisciplinary societies such as ELAW and Alianza Kanan Kay, raising this score from 40% to 60%.

New efforts currently underway in México to address Sewage and Sanitation may provide opportunities to improve management scores over the coming year. Although no increases were achieved in sewage and sanitation in 2016, there has been considerable work with CONAGUA, CAPA and the municipalities to upgrade water treatment plants to tertiary to meet Cartagena Protocol standards.

Honduras

Honduras had a score of 60% and the most progress in implementing management actions to protect their coral reefs. They had 9 indicator improvements - the largest number for any assessment period since Eco-Auditing began, earning it the “most improved” title.

For Marine Protected Areas, significant progress was achieved for 1c. the amount of coral reef area within full protection, which increased to 16.3 km² or 10.2% of coral reef area including near reefs near Guanaja. These new fully protected reserves will provide refuge populations to replenish. Additional progress was made in the amount of enforcement in MPAs, which increased to 58% of the MPAs now with moderate enforcement.

For Ecosystem-based Fisheries Management, scores improved for indicator 2d. which measures progress towards transforming all open-access fisheries to rights-based sustainable fisheries management. A long history of open-access fishing has negatively impacted Honduras’ reef health because it encourages overfishing, illegal fishing, and a lack of stewardship. New efforts to address open-access fishing are helping to improve sustainable fisheries.

For Coastal Zone Management, Honduras made progress in indicator 3b. Watershed management plans related to coastal zone planning. Currently, over 50% of the Honduran-MAR watersheds are now within watershed management plans with some form of protection or management.

For Research, Education and Awareness, Honduras increased its score for indicator 5d. which measures interdisciplinary ecological and social partnerships. A significant management achievement was the protection of the Tela MPA. A collaborative effort by the community, scientists, and government led to the creation of a new Marine Protected Area around nearshore reefs, which support vast stands of >800 healthy endangered elkhorn corals.

Management opportunities for the future include improving Sanitation and Sewage Treatment. Progress has been made in creating a sustainable service model of sewage treatment facilities in the West End of Roatán and a new goal has been set to replicate this model in six other coastal communities in Honduras.

Guatemala

Guatemala had a score of 54% with significant progress in 5 indicators.

The largest single indicator increase yet recorded was for Ecosystem-based Fisheries management with indicator 2c. protection of parrotfish, achieving 100%. Last year, HRI, the Fisheries Department and local fishers and stakeholders worked together to protect parrotfish. The result was the passage of a regulation fully protecting parrotfish in a 5-year fishing ban. These efforts will result in more parrotfish on the reef providing higher rates of herbivory that should reduce the overabundance of harmful fleshy macroalgae and allow for the growth of more live coral.

For Marine Protected Areas, Guatemala improved the 2016 score of two different indicators. Indicator 1e. Percent of MPAs with good management was increased from 60% to 80% due to implementing legal regulations inside two MPAs. Both MPAs now have better management capacity, management plans, staff, and equipment. Also new this year was progress to improve 1f. Alternative livelihoods for fishers within MPA networks. A long history of open-access fishing has encouraged overfishing, illegal fishing, and a lack of stewardship. A new project of KfW/ MAR Fund implemented by CONAP and ASOPROGAL aimed at strengthening local communities for best management practices and sustainable use of coastal marine resources has helped implement activities to develop long-term economic alternatives for improving the quality of life of 6 communities of fishers within the Punta de Manabique Wildlife Refuge.

The Future of our Coral Reefs

The MAR's coral reefs are threatened by multiple stressors within and outside the control of local and even national management. The 2015 MAR Reef Report Card found that overall, the Reef Health Index score was 'fair' (2.8), on a scale of 'critical' (1) to 'very good' (5), with encouraging improvements at both the regional level and of individual indicators since the last report. However, as the 2016 Eco-Audit highlights, much more needs to be done to maintain the areas identified as healthy and improve those places that are still in poor or critical condition. The third mass global coral reef bleaching event is currently underway and the 2015-16 El Niño year is projected to rival the intensity of the record 1997-98 coral bleaching event – the event that was the most devastating in the MAR region to date. Now, more than ever, we need to increase our conservation efforts and reduce human-induced impacts.

Overall, we are making improvements, but we can accelerate the pace of implementation even further to better improve and enhance the Mesoamerican Reefs long term health and integrity. Priorities and opportunities to improve management include:

- MPAs- Enforcement is a key element to improving the effectiveness of MPAs.
- Fisheries- Good regulations and enforcement so the laws and fishing bans established actually are met, as well as the protection of key species, parrotfish, groupers, lobsters etc.
- Coastal Zone Management- Good plans for coastal zone and zoning regulations are needed.
- The lowest overall theme for all countries is sanitation and sewage treatment; the impact this theme has on the reef ecosystem is high. To raise this score, the organizations being academia, government, NGOs and private sector need to work together to achieve significant progress for 2020. New infrastructure meeting the Cartagena Convention needs to be developed.
- Research, Education and Awareness- It is important to keep up the work that is being done in the region regarding coral reef monitoring, and also bleach watch, however we are lacking assessment of coral reef economic values for Guatemala.
- Sustainability in the Private Sector– The private sector needs to get more involved. Participation of hotels in eco-certification schemes are needed and the development of voluntary eco-standards program for marine recreation providers is needed.
- Global Issues- Research to identify and map reefs most likely to be resilient to warming seas / coral bleaching is still needed for the MAR, especially since we have Climate Change as one of the biggest stressors for our reefs.

For more information

Visit <http://www.healthyreefs.org> for the full Eco-Audit, including:

- A new interactive web exploration of the results by theme and country over the three assessment periods.
- Detailed workbooks of the 2016 Eco-Audit results and observations for each country.
- Compilations of all publicly available verification documentation for each country.
- The background documents that provide an overview of each theme and indicator, including its justification, ranking criteria, and data collection methods. *2011 Eco-Audit of the Mesoamerican Reef Countries: Description of Indicators*. Healthy Reefs Initiative and World Resources Institute.

56pp. The six indicators added in 2014 are described in: 2014 Supplement to New Eco-Audit Indicators.

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