

Key Findings

1. The majority of the world's coral reefs are threatened by human activities.

- More than 60 percent of the world's reefs are under immediate and direct threat from local sources —such as overfishing and destructive fishing, coastal development, watershed-based pollution, or marine-based pollution and damage (see map inside front cover).
- Approximately 75 percent of the world's coral reefs are rated as threatened when local threats are combined with thermal stress. This reflects recent rising ocean temperatures, which are linked to the widespread weakening and mortality of corals due to mass coral bleaching (Figure ES-1, column 6).
- Thirty percent of the world's reefs have experienced an increase in threats in the 10 years since the first *Reefs at Risk* analysis (1998).

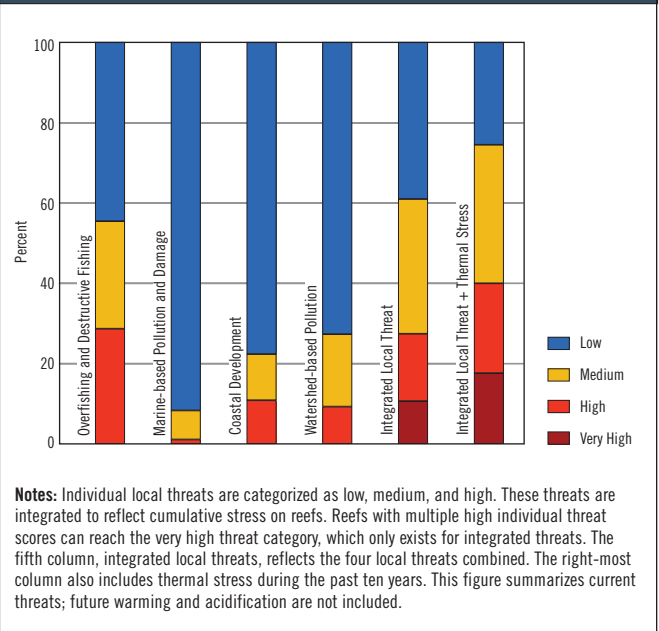
2. Changes in climate and ocean chemistry represent significant and growing threats.

- *Coral bleaching*: Rising greenhouse gas emissions are warming the atmosphere and, as a result, increasing sea surface temperatures. Mass coral bleaching, a stress response to warming waters that can weaken or kill coral, has occurred in every coral reef region. It is becoming more frequent as higher temperatures recur.
- *Ocean acidification*: Increasing carbon dioxide in the ocean is altering ocean chemistry and making the water more acidic, which can slow coral growth rates and, ultimately, weaken coral skeletons.
- If local and global threats are left unchecked, the percentage of threatened reefs will increase to more than 90 percent by 2030 and to nearly all reefs by 2050.

3. Reefs are highly valuable to people around the world, providing livelihoods, food, protection, recreation, and even pharmaceuticals.

- *People*: Worldwide, approximately 850 million people live within 100 km of coral reefs, many of whom are

FIGURE ES-1. REEFS AT RISK WORLDWIDE BY CATEGORY OF THREAT



likely to derive some benefits from the ecosystem services the reefs provide. More than 275 million people reside in the direct vicinity of reefs (within 30 km of reefs and less than 10 km from the coast), where livelihoods are most likely to depend on reefs and related resources.

- *Food*: A healthy, well-managed reef in the Indian or Pacific Oceans can yield between five and fifteen tons of seafood per square kilometer (sq km) per year in perpetuity. Reef-associated fish species are an important source of protein and contribute about one-quarter of the total fish catch in developing countries.
- *Shorelines*: Coral reefs protect 150,000 km of shorelines in more than 100 countries and territories—helping defend against storms and erosion.
- *Tourism*: At least ninety-four countries and territories benefit from tourism related to reefs; in twenty-three of these, reef tourism accounts for more than 15 percent of gross domestic product (GDP).

- *Disease prevention:* Many reef-dwelling species harbor the potential for forming life-saving pharmaceuticals, including treatments for cancer, HIV, malaria, and other diseases.

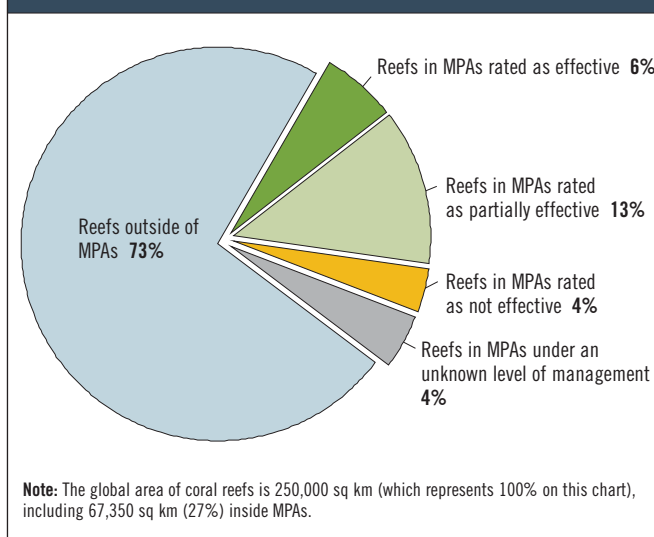
4. Degradation and loss of reefs will result in significant social and economic impacts.

- Of the twenty-seven countries and territories most vulnerable to coral reef degradation and loss, nineteen (70 percent) are small-island states.
- Nine countries—Haiti, Grenada, Philippines, Comoros, Vanuatu, Tanzania, Kiribati, Fiji, and Indonesia—are most vulnerable to the effects of coral reef degradation. Reefs in these countries face high threat levels, and coastal residents are highly dependent on reefs and have limited capacity to adapt to reef loss.

5. While more than one-quarter of the world’s coral reefs are within protected areas, many of these are ineffective or only offer partial protection.

- Approximately 27 percent of the world’s coral reefs are within marine protected areas (MPAs), a higher proportion than for any other marine habitat. Of the reef area inside MPAs, more than half is in Australia.
- Based on our compilation of expert-based ratings of management effectiveness, we find only 6 percent of the world’s coral reefs are located in effectively managed MPAs and 13 percent are in areas rated as only partially effective for achieving management goals (Figure ES-2).
- MPA coverage tends to be in areas of lower threat, and thus less frequently reduces threats in areas of heavy human pressure.

FIGURE ES-2. CORAL REEFS BY MARINE PROTECTED AREA COVERAGE AND EFFECTIVENESS LEVEL



6. Policy makers, government officials, resource managers, and others need to take action to protect reefs, and to manage risks locally and globally.

- Reefs are resilient—they can recover from coral bleaching and other impacts, particularly if other threats are low.
- Reducing local pressures on reefs—overfishing, coastal development, and pollution—is the best way to “buy time” for reefs. Doing so would help reefs survive warming seas and ocean acidification while the global community works to reduce greenhouse gas emissions, particularly carbon dioxide.